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# The Journal

OF THE

## EAST AFRICA AND UGANDA NATURAL HISTORY SOCIETY

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Oct., 1933—Jan., 1934.

Vol. XII.

Nos. 1 & 2

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EDITOR:

V. G. L. VAN SOMEREN.

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Additional copies to members, 7/50; non-members, 15/-.

Date of Publication: February, 1935.

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# THE BIRDS OF KENYA AND UGANDA.

## VOL. II. PART 4.

BY

V. G. L. VAN SOMEREN, M.B.O.U., C.F.A.O.U., F.L.S., etc,

### CHARADRIIDAE. Continued.

*CHARADRIUS (EUPODELLA) ASIATICUS*, Pallas. CASPIAN or  
ASIATIC DOTTEREL.

Ref. : Pallas, Reise Russ. Reichs. 11, p. 715, 1773.

Type locality : S. Tartary.

#### DISTRIBUTION :

A migrant from S.E. Russia and the Altai. Wintering in Eastern Africa (Uganda and Kenya). Most plentiful on the open plains where the grass is short, but also occurs along the sea coast.

#### DESCRIPTION : MALE, SUMMER.

Forehead, lores, cheeks, throat, and superciliary stripe, white; a blackish spot at anterior angle of the eye shading to ashy-grey below the eye and extending to the upper ear-coverts. Crown, ashy-olive-grey, darker in front and lighter at nape; back of neck, mantle, scapulars, lesser and median coverts and long secondaries, and rump, olive-ashy-grey with pale buffy margins. A broad light-chestnut breast band sharply defined from the white of the throat, and merging into the ashy on the sides of the chest is separated from the white of the rest of the underside by a black bar. Upper tail coverts olive-ashy, buff edged; tail feathers ashy-grey, darker toward ends and tipped with buffy and white. Primaries and secondaries blackish-brown with white shafts. Legs and toes olive-brown; bill brownish at base, black at tip; eyes brown to hazel. Length of wing 145-155 mm.

#### WINTER :

Very similar to the above but with the chestnut breast-band paler, and hardly any black border; and the pale margins of the mantle feathers more pronounced.

#### FEMALE :

Very similar to the male but the ear-coverts darker, and the throat less pure white, the superciliaries tinged buffy, while the breast-band is ashy-grey pale edged and only slightly washed with pale chestnut. Wing, 139-145 mm.

#### WINTER :

Very similar to the summer, but the pale edging to the back feathers more pronounced: the breast-band darker more ashy, and without a trace of the chestnut wash.

#### IMMATURE : FIRST WINTER.

Somewhat like the female but the whole of the upper side rather darker in ground colour though the margins of the feathers are broader and more buffy to sandy giving the whole a strongly mottled appearance. The forehead, cheeks and supercilium are washed with buffy, while the breast-band is strongly ashy with pronounced buffy tips which wear off early.

#### JUVENILE :

As the species does not breed here, we need not consider this.

#### HABITS :

This is entirely a migratory species which breeds in S.E. Russia and spends the winter in Eastern and Southern Africa. The first arrivals have been noted as early as August 29th, but they usually arrive during the third week of September. By the first week of October large flocks, sometimes up to one hundred individuals or more, may be seen on the plains around Nairobi, and in fact anywhere where there are open plains with short grass. They are extremely partial to areas which have been burnt off. Their colour is extremely cryptic; so much so, that one may frequently be unaware of their presence until one has walked or driven almost on top of them when they will get up with a whirr, and after circling around for a while alight at or near the spot from which they were disturbed.

The white primary shafts are a conspicuous feature when these birds are in flight. When they settle they usually take up their position near some stone or hummock of grass and their colour so blends with their surroundings as to make them inconspicuous. The Asiatic Dotterel is by no means a shy bird, in fact quite the contrary. They seldom fly far even when flushed several times. During the heat of the day they are particularly loath to move; it is at evening time that they become more restless. These birds are often referred to locally as "Veldt Snipe," and hundreds are shot for the pot. After a month or two in this country they become extremely fat and are quite good eating.





Juv.

Adult male

ASIATIC DOTTEREL (*Charadrius* (*Eupodella*) *asiaticus* Pallas.)

Adult female









Female

Male (summer)

EUROPEAN GREY PLOVER (*Squatarola squatarola* Lin.)



They flight at night time, and it is then that one hears their rather shrill whistling call. On several occasions I have made a critical survey of all the individuals of a flock and have noted that all individuals arriving early are immature birds with one or two adult females. It is only towards the middle of October that one begins to see adult males, but by March most of the males have assumed full plumage and are then quite easy to pick out. In spite of their pronounced breast-band the general plumage harmonises well with the surroundings. As these birds rest at ease, they ruffle their body feathers out and become plump and rounded. They feed almost entirely on insects, but crop examination reveals a certain quantity of fine grass seed also.

The northward movement takes place towards the end of March, some few flocks remain till April and a few stragglers may even be met with in May. One exceptionally late bird was obtained on the 22nd June.

*SQUATAROLA SQUATAROLA SQUATAROLA*, L. EUROPEAN  
GREY PLOVER.

Ref.: Linnaeus, Syst. Nat. 10th Ed., 1758.

Type locality: Sweden.

DISTRIBUTION:

Along the coast of Eastern Africa but occasionally on the larger inland waters.

DESCRIPTION: ADULT, WINTER.

The whole of the underside from chin to vent, white; some slight dark streaking on the sides of the throat, greyish ashy mottling on the breast, centre of each feather dark streaked. Lores and cheeks white, dark streaked; forehead and supercilium white; crown of head, back of neck and mantle, back and rump ashy-grey to sepia with white tips and marginal spots. Lesser and median wing coverts similar but white more conspicuous. Secondaries ashy-grey-brown with white edges to outer webs, paler on inner; primaries dark sepia, with large white area on inner webs, shafts partly white; sixth primary with white on outer web. Upper tail-coverts white with sparse sepia bars; tail feathers white with sepia bars. Axillaries black. Legs and toes greyish-green; bill blackish, paler at base; eyes brown. Length of wing 190-195 mm.

FEMALE:

Very similar.

MALE: SUMMER.

Many specimens arrive with partial summer dress which is quickly shed. By the time they are ready to move north the males have again

assumed almost full plumage which is as follows: Forehead white; cheeks, sides of neck and most of underparts, black. Crown, nape, mantle, scapulars, back and rump dark sepia with white tips and white notches on margins. Supercilium white, which colour continues down the neck thus separating the black of the fore-neck from the speckled sepia and white hind-neck.

#### FEMALE: SUMMER.

Somewhat like the male, but the white tips on the upper surface not so conspicuous; the blackish of the underside rather brownish tinged and not uniform, being heavily mottled with white. Under tail-coverts white with brown-black bars. Wings 180-190 mm. Legs and feet as in the male.

#### IMMATURE:

Very similar to the adults, but upper plumage not so clearly marked, white rather tinged with creamy to buff most conspicuous on the median coverts.

As the birds do not breed here we need not consider the juvenile plumage.

#### HABITS:

The Grey Plovers found along the coast of Eastern Africa can at once be distinguished by the black axillaries. It is possible that those found toward the mouth of the Juba River belong to the eastern race *hypomelana*. These Plover are almost entirely confined to the maritime littoral though some few have been noted on the larger inland waters.

They occur in flocks of half a dozen up to a hundred and do most of their feeding at low tide or when the tide is on the ebb. Their food consists of various aquatic insects, mollusca, crustacea, also worms and occasionally seeds. When feeding they straggle out but when at rest they bunch into groups. There is a certain amount of local movement along the coast but this is nearly always relative to the tides and resting places. Evening flights are sometimes observed more particularly towards the time of the northward migration. These flights are usually accompanied to the low plaintive call note, somewhat like "thui thui" oft repeated.

The southward movement is usually observed in October and these birds remain in suitable localities until the end of April when the north migration takes place.







LESSER GREY-BREASTED PLOVER (*Stephanibyx lugubris lugubris* Less.)

Genus *STEPHANIBYX*.

*STEPHANIBYX LUGUBRIS*, Less. LESSER GREY-BREASTED  
PLOVER.

Ref.: Lesson. Dict. Sci. Nat. xlii, 1826.

Type locality: Senegal. (Apud Grant.)

DISTRIBUTION:

From the coastal belt inland through Kenya at altitudes under 9,000 ft. to Uganda.

DESCRIPTION: MALE, FEMALE, ADULT.

Circular patch on forehead white; top of crown to nape dark ashy-grey; lores, cheeks, supercilium, ear-coverts and side of neck and chest dark grey, paling towards the middle of upper chest, turning white on throat and chin to black on lower edge of chest band. Rest of the underside pure white. Mantle, back, scapulars, lesser coverts, and long inner secondaries ashy-olive, slightly more brownish on the median coverts and greater coverts, the latter white-tipped. Primaries blue-black, less blue on inner webs, inner ones increasingly white-tipped; secondaries mostly white, with an increasing area of blackish basally, from in to outer. Axillaries white; base of rump dark ashy, rest white; upper tail-coverts white, tail feathers mostly white, the centre pair black for terminal inch, next three pairs with decreasing black at ends from within-out, but white-tipped.

The female has a less conspicuous white frontal patch and not so marked black chest-band.

Legs and feet dark-brown to blackish; black bill; eyes yellow to straw colour. Length of wing: 158-187 mm.

IMMATURE:

Differs from the adult in having the breast less pure grey, rather tinged with dirty-ochreous, and there is no blackish breast-band. The throat is not so white. The forehead lacks the frontal patch, this area being only slightly paler than the rest of the crown which is similar in colour to the remainder of the upperside, viz., olive-ashy each feather with paler tips. The coverts of the wing are strongly tipped with ashy-brown giving this area a somewhat barred appearance. The upper tail-coverts are whitish with buffy tips; the dark bar on the tail is more brownish than black; the primaries lack the strong blue-black colour of the adults—they are brown-black with paler tips. The legs and feet are more brownish. Eyes brown or ochreous.

JUVENILE:

The downy plumage is very similar to that of *melanopterus*, and in fact to several of the larger plovers. The whole of the upper surface



is a mottled ochreous and black-brown, the ochreous colour predominating; there is of course the usual white neck band which, though conspicuous when the youngster stands up, is completely hidden when it is squatting. The whole of the underside is white with a greyish wash, slightly spotted on the breast; the back of the thighs are coloured like the back. Legs and bill brownish; eyes very dark brown.

#### HABITS:

The Lesser Grey-breasted Plover has a wide distribution over Kenya and Uganda, but it is not resident in any one locality throughout the year. Recorded localities include Lamu and the mainland opposite, places along the coast from the mouth of the Juba River to Dar es Salaam, Ukambani, Athi Plains, Nairobi, Naivasha, Nakuru, Sotik and Kericho, Uasin Gishu Plateau and the Cherangani, Turkana, Lake Victoria on the eastern side, and various localities in Uganda. One comes upon these birds in the more open grass country and plains, in small parties of four to a dozen or so, more often far from water. They are not shy when approached in a car, but dislike the too near inspection on foot. They avoid detection by remaining still, but if one comes upon them suddenly they scatter and run and only take flight if disturbed several times. They flight for a short distance in a circle and soon return to ground. Their flight is typically plover-like and rather slow. There is only one species with which these birds can be confused, namely the Greater Grey-breasted Plover, *Stephanibyx melanopterus minor*. The lesser species is olive above without the distinct purply sheen, so pronounced a feature of the larger bird; furthermore it is less blue-blackish on the breast and has less white on the wing.

In Kenya, the nesting season more or less corresponds with the rains; in Uganda eggs have been taken in January and September. The area selected for the nest is one where the grass is always short or sparse or devoid of herbage. The nest is a shallow scrape on a slight mound or stunted tuft of grass, with little or no material added. Two to four eggs are laid; typical plover shape—large at one end and tapering abruptly at the other. They are very similar to those of the Common Lapwing, but smaller. The ground-colour is olive-brown or putty colour with submerged umber-brown marks and blackish surface blotches. Size varies: average measurements 44 × 30 mm.

Incubation lasts 18—20 days. The young leave the nest almost as soon as dry. The parents are assiduous in their care and adopt the usual plover habit of feigning injury to a wing and fluttering along the ground, so as to distract attention from the young birds who in the meantime have squatted and thus become invisible. If search for the young is maintained, the parents become restless and will then fly around, making downward swoops towards the intruder. The food





Adult

LARGER GREY-BREADED PLOVER (*Stephanibyx melanopterus minor* Zedlitz.)

Juv.



consists almost entirely of insects and their larvae, but some grass seeds are also taken.

The young feather very quickly, but a considerable period elapses before they fly. They remain with their parents for over two months and when strong on the wing several families will unite and frequent the feeding grounds in an area, after which they migrate. There is not the slightest doubt that local migration takes place, but times and directions are very imperfectly known.

A small flock frequented a certain area in the south Game Reserve for a period of a month in March-April; they showed no signs of wishing to nest. On the other hand, very large herds of game were present and as usual had their regular resting places which soon became covered with droppings; it was on these places that one always found the plover. The attraction, of course, was the immense number of beetle larvae, mostly Scarab, present in the dung. One is led to wonder whether there is not some connection between the presence of plover and game in a given area, the migrations of the two being inter-related?

*STEPHANIBYX MELANOPTERUS MINOR*, Zedlitz. LARGER  
GREY-BREASTED PLOVER.

Ref.: Zedlitz, Orn. Monatsb. xvi, 1908.

Type locality: South Africa.

DISTRIBUTION:

Kenya, occupying the highland plateau; not recorded from the coast.

DESCRIPTION: MALE AND FEMALE, ADULT.

Frontal band white; crown and nape lead grey; cheeks, supercilium and side of neck paler grey; lores dirty whitish with a darker gape streak; chin and upper throat whitish shading into lead-grey and then into blue-black over the chest-band. Rest of underside white. Mantle, scapulars, long inner secondaries and lesser coverts olive-ashy with a pronounced purply sheen; back ashy-olive. Median wing-coverts like the mantle ending in a black sub-terminal bar followed by a white tip; secondary coverts similar but white end very broad; primary coverts blue-black. Primaries blue-black with bases white; secondaries white with broad terminal oblique black ends widest externally and diminishing in width toward the long secondaries. Upper tail-coverts white; tail feathers mostly white with black terminal band, widest at mid-pair and diminishing toward outer-pair, each with a narrow white tip. Legs and toes dull carmine, brightest at thighs; bill brown at base shading to black distally; eyes yellow, straw or orange, with eyelids carmine. Length of wing 211-218 mm.

The female is very similar to the male but lacks any well marked white frontal band; the crown of the head is less blue-grey while the cheeks and ear-coverts are less pure grey, more ashy-ochreous-grey; the breast is less grey and the black shading not so strong.

#### IMMATURE: 1ST FEATHERED STAGE.

The first feathered plumage is as follows: Forehead only slightly paler than the rest of the face; crown dark ashy, each feather with ochreous-sandy tip; lores and cheeks ashy washed with ochreous-sandy, rather greyer below the eyes; throat whitish, gradually shading into the ashy-grey of the breast, each feather with buffy tips; the ashy of the breast sharply defined from the white of the rest of the underside but no black breast bar. The absence of the breast bar and dark nape line differentiates this bird from the young of *S. coronatus*, of a similar age.

The mantle is dark olive-ashy with sandy tips to the feathers; scapulars and wing-coverts similar but sandy-ochreous tips and vermiculations wider and more pronounced. Legs ochreous-pink.

#### IMMATURE:

The second stage is very similar to the female but crown and neck only slightly more grey-tinged than the rest of the upper-side which is ashy-olive without any purply sheen. Wing-coverts more ochreous ashy with pale ends to each feather; white of secondary coverts tinged with ochreous at tips. Rump feathers tipped ochreous. Primaries black with little blue-gloss. Legs and feet brownish, with a little dull carmine at thighs.

#### JUVENILE:

The downy chick is very similar to that of *lugubris* but can be distinguished by the presence of a central dark line on the dorsum and a dark patch on either side of the pelvic region.

#### HABITS:

The Larger Grey-breasted Plover is an inhabitant of the open high-land plains and grass lands. It is particularly plentiful on the Athi Plains and Ukambani, and again on the Kinangop-Laikipia plateau. They are usually seen in flocks of half a dozen up to fifty birds, but this of course is during the non-breeding season. They are associated with the presence of game as has been noted in the case of the previous species. The association is connected with the food supply. One observes these birds feeding on the places where the game lie up. They turn up the dung with a rapid side movement of the bill and amongst it they find the larvae of various beetles and flies and worms. They also hunt for this type of food on the edges of swampy ground where

decaying vegetation harbours the grubs. As the nesting season approaches, usually with the onset of the rains, these birds split up into pairs. The nest is an open scrape with little lining usually on a slight rise. Three to four eggs may be laid, but not infrequently only two form the clutch. They are putty-coloured with numerous black blotches and marks. Both parents will incubate the eggs but most of this task is left to the female. Incubation lasts about 20 days. They adopt the usual Plover tactics in an attempt to distract one's attention from eggs or young. They do not utter their alarm note unless unduly excited. The call is a harsh "che-che-che-cherek" uttered when on the wing or on the ground.

There is undoubtedly some local migration, but relative to what is unknown. In one locality outside Nairobi these birds appeared in March. They remained in the vicinity up to September 5th and disappeared, though hunted for over the plains for fifty miles. They had not bred during their sojourn, though their near relatives the Crowned Plover had brought off two broods! Much remains to be learnt about these birds.

Nests and young have been noted in May—July and in November—December on the Nairobi Commonage.

*STEPHANIBYX CORONATUS CORONATUS*, Bod. CROWNED  
PLOVER.

Ref.: Boddaert, Tabl. Pl. Enlum, 1783.

Type locality: Cape of Good Hope.

DISTRIBUTION:

Kenya, from the open plains country of Jubaland west through Ukambani and the Athi Plains, the Highland Plateau, Northern Frontier, and westward through northern Uganda to Ankoli. (In this distribution, are included birds which are recognised as a geographical form by Friedman, Cf. U.S.N.M. Bul. 153, pp. 161-166, 1930.) For remarks vide post.

DESCRIPTION: MALE AND FEMALE.

Forehead, lores and gape black continuous with a pronounced black supercilium which extends back to the nape in a V and encloses a white coronal patch in the centre of which is a black area; ear-coverts, cheeks and side of neck ashy-grey with ochreous wash paler on the chin and throat and gradually shading to a deeper colour on the breast then to black, thus sharply defining the breast from the pure white of the rest of the underside. Hind-neck, mantle, scapulars, long inner secondaries, lesser wing-coverts ashy-grey with an ochreous-olive wash more particularly on the mantle. Rump similarly coloured. Median and secondary coverts like the mantle but with white ends, and primary



coverts mostly white thus forming a white band across the wing. Primaries mostly blue-black with increasing basal white from without inward; secondaries mostly white with black ends, the black increasing from within outward, but inner secondaries white with ashy-ochreous grey. Upper tail-coverts white. Tail feathers white with a broad subterminal black bar. Legs and feet madder; eyes yellow, orange or orange red; bill madder at base, tip black.

#### IMMATURE :

Coronal markings of the adult plumage indicated by a black-brown circlet tipped with buff; whitish area tinged with buff, median dark area heavily tipped buffy. Breast and whole of back light-ashy with ochreous wash transversely vermiculated with darker ashy and sandy-buff. Dark breast-band indicated by blackish feathers buff tipped. Primaries dull black; secondaries dull black tipped. White areas very much as in the adult. The downy buff and black tips are retained for a long time on the tail feathers. This plumage is retained for quite a month after the young is capable of strong flight. It is then gradually moulted; the head markings, black and white become purer, the breast more uniform, as also the mantle, but the vermiculations of the wing-coverts and the long inner secondaries are retained until the bird is about four months old when they are gradually shed. The complete moult into full plumage does not take place until after the first six months.

#### JUVENILE :

The downy plumage is typical of the plover tribe. Top of head dull blackish each downy tuft with broad sandy to ochreous tips; the coronal circlet is indicated by paler tipped down mixed with white; the black nape line is indicated by black down; throat, sides of head and hind-neck white; down on breast sandy-buff shading to ashy on the breast band; the whole of the upper-side mottled sandy-buff and dark ashy, with a median dorsal line of blackish down. Belly white. The wing feathers soon sprout; the white secondary coverts become conspicuous. Legs and feet pinkish. (Cf. note on Jubaland race.)

#### HABITS :

The Crowned Plover is widely distributed over the highland plateau and grass-lands frequenting those areas where the grass is short or sparse or even wanting. The species is commonest on the Athi Plains, Northern Frontier and Ukambani, extending through the Rift Valley, on to the high plateau of the Mau, Eldoret, and suitable localities in Uganda and become plentiful in the western province from Lake Albert to Ankole. It may be advantageous at this point to discuss the various geographical races which have been cited though not generally



Adult

Juv.

CROWNED PLOVER (*Stephanibyx coronatus* Bod.)





recognised. I refer in particular to the opinions expressed by Friedman, United States Nat. Bul., 153, in which two races other than the nominate form are recognised. According to this writer, the nominate race extends from the south (Natal) through Tanganyika to the highland plateau *excluding* the Mau, to Uganda. Is darker more grey-brown on the upper parts. The birds from the Mau, he unites with a large north-eastern race of Abyssinia which he names *suspicax*. It is of interest to note then, that the Mau birds are separated from the Abyssinian form by miles of low country inhabited by the nominate form. It is suggested that altitude and environment have produced a form similar to the Abyssinian one. Such is possible, but I am very much disinclined to accept the validity of the statement.

The third race *demissus*, inhabits the lowlands of Somaliland. It is said to be more sandy-rufous above. It is also suggested that birds from Barsaloi, Northern Frontier, Kenya are intermediate between this and the nominate race, further that the form may range across Jubaland. The limited adult material at my disposal from Jubaland supports the pale colouration assigned to the race. However, young in down from Wagedud, Jubaland, collected in June, are very different to young of the same age from the Athi Plains. They are very much more rufescent-sandy. I incline therefore, to support the suggestion that Juba birds do belong to the Somali form. Birds from the Northern Guasso area to the Lorian are intermediate. The general habits of all the races are similar. They are most in evidence during the non-nesting seasons, for then they assemble in large flocks, sometimes numbering over 100 individuals. These flocks are made up of adult and sub-adult birds. The latter may always be recognised by the less conspicuously marked coronal colouration and the presence of pale tips to the mantle and wings which give these areas a slightly barred appearance.

These birds are vociferous when disturbed but when left alone hardly utter a sound. Nevertheless, one is always stumbling upon them, more often at some crucial moment when one is stalking a buck or other prey. They then get up and give utterance to their piercing harsh call likened to the syllables cre—cre—cre—cree-ip . . . cree-ip, and every head of game in the area is on the "qui vive." Fortunately, unless they have eggs or young, their flight is not long sustained; circling round once or twice they alight, and uttering a plaintive whistle cree-ip, they soon settle down. If, on the other hand, they are approached when brooding eggs or young, they get up and after running a few paces they start calling when one is still some distance away and as one gets nearer they take wing and will then swoop down towards the intruder, in much the same way as does the European Lapwing. They are quite fearless in their attacks on dogs and more than once I have seen a dog cowering before the vicious onslaught. Jackals and Bat-eared Foxes are chivvied in the same way. They draw attention

from their young by feigning a broken wing or leg and as they flutter away they call persistently. The nesting season varies somewhat. We have observed eggs or young in down during March, April, to July and also September; and again in October to December. The rather prolonged nesting period is partly accounted for by the fact that more often than not, the first clutch of eggs are destroyed; ground vermin such as mungoose, foxes and jackal are particularly destructive, to both eggs and chicks.

The food supply for young and adults is plentiful throughout the year, for here again, much of it consists of various larvæ obtainable from the accumulated droppings of the numerous game.

The nest is a shallow scrape either on bare pebbly ground or amongst tufty grass, more usually the former. The clutch varies: the commonest number is two, occasionally three and less often four. They are typically plover in shape, stone, putty or olive-tinged in ground colour covered with small blotches and marks of umber and blackish. There is some variation in size but average clutches measure  $38 \times 28$  mm.

Young in down are cryptically coloured, and were it not for the fact that one sees them move, one could not detect them. Should they be feeding with their parents, when first observed, one notices the white underside and white neck ring, but almost at the first alarm note they squat with head tucked into the body, thus obliterating the greater part of the neck ring, and they are difficult to detect. The way to pick out the youngster is to disregard the adult birds and when the alarm is given to note some particular object near where the chick has squatted. One can then walk straight up to it and it will be found crouching, almost motionless. It will allow one to pick it up and replace it without running off. There is not the slightest difficulty in recognising these birds; the conspicuous coronal marks and the red legs distinguish it at once.

Night fighting is common in this species, more especially when there is a moon. One often hears them moving across the line of the Museum building in a north-easterly direction.

The Crowned Plover is considered by some as of interest from a sporting point of view; it must be tame sport, unless the shooting is done during the night flights.

When these birds have flocked, they break up into small companies at periods when they search for food, but unite again before sunset. Towards evening they indulge in playful antics in much the same way as do the Crowned Cranes, but they do not seem to have the same set "dance." It is an attractive sight more particularly when several or most will, as though at a pre-arranged signal, suddenly raise the wings perpendicularly over the back retaining them thus for an appreci-







SPUR-WINGED PLOVER (*Hoplopterus spinosus* Lin.)

able time, then bringing them smartly down to rest. The black and white under-surfaces are then conspicuous.

In my experience, these birds can be called confiding if treated properly; in a car one can approach to within a couple of yards before they run off. The photographs illustrating the birds were obtained from the car window, with a five-inch lens.

Quite apart from the slightly barred plumage of the sub-adult bird, one can generally pick these out by their behaviour; if a flock is seen and approached, these younger birds, having still some memory of the value of squatting, learnt as youngsters, will sit down and "flatten" and will remain thus until one is almost on top of them.

### Genus *HOPLOPTERUS*.

*HOPLOPTERUS SPINOSUS SPINOSUS*, Lin. SPUR-WINGED  
PLOVER.

Ref.: Linnaeus, Syst. Nat., 10th Ed., 1758.

Type locality: Egypt.

#### DISTRIBUTION:

Through the north and eastern portions of Uganda, east to Rudolf, Baringo, the Northern Frontier, Jubaland, Tanaland, south Ukamba, Kavirondo, Lake Victoria.

#### DESCRIPTION: MALE AND FEMALE, ADULT.

Entire top of head from forehead to nape, blue-black; the feathers on the back of the crown elongated to form a pointed crest; sides of head and neck pure white with a blue-black streak running from the chin, down the centre of the front of the neck, and joining the blue-black of the breast and upper abdomen; rest of abdomen and under tail-coverts pure white. Mantle, scapulars, long inner secondaries and rump ashy-grey with an ochreous wash; lesser wing-coverts ashy-grey shading to whitish distally; median coverts paler; secondary coverts white with greyish tinge on inner web; primaries blue-black; secondaries white at base, blue-black distally; upper tail-coverts white; tail proximally white, distal half black, the outer pairs with white tips. Thighs white. Legs and toes black; bill black; eyes claret, red, ruby or crimson. Length of wing 182-203 mm.; average for females 185, males 195 mm. A marked spur on angle of wing, sometimes measuring 20 mm.

#### IMMATURE:

Crown and throat line and breast ashy-ochreous; rest of head dirty white; mantle ashy-grey with buffy tips to each feather; primaries and secondaries black; coverts dirty ashy-whitish. Legs and toes black; bill black; eyes dull red.



## JUVENILE:

The nestling in down is unknown to me, and there appears to be no available published description.

## HABITS:

This Spur-winged Plover has a wide range throughout Kenya and Uganda but does not appear to have been recorded from the central highland area of the former. My records are from Anasa on the Tana River, Kitui Ukambani, Lake Jipe, N. Guasso Nyiro to Marsabit and Lake Koroli, north and south of the Juba River, Baringo, Kendu Bay, Kavirondo, Turkana and Kobua River, Rudolf, Lake Kioga, Lake Kikarongo, Lakes Albert and Edward and Buddu. Wherever it occurs it is there in numbers, from scattered pairs to flocks of fifty or more. Like others of this group, they are very noisy, maintaining an incessant call when disturbed. The call is similar to the syllables hick-hick-hick, oft repeated, thus very like that of the Saddle-backed Plover, but less metallic. They are usually found in the vicinity of water. When undisturbed they stand with heads depressed between the "shoulders," and if a strong wind is blowing, all the birds face towards it. When on the ground and first disturbed, they run a short way, stand, and jerk their bodies up and down with abrupt spasmodic movements and quick lateral movements of the tail which end in a quick depression and partial fanning of the feathers. Where these birds are abundant, they nest in what may be termed colonies, for several will nest on a sand or gravel spit within a short distance of each other. In Kenya, no considerable nesting areas exist; the nests are usually scattered. My friend Mac Innes has already published an account of the nests of these birds in this Journal: (No. 47-48 p. 128.) he states: "It is often very difficult to see the bird on the nest, as it invariably leaves at the first sign of danger, and circles round the intruder, uttering loud cries. On closer approach the bird often becomes silent, settling on the ground some distance away, thereby disclosing the presence of the nest."

He also observes that in a clutch, one may find the eggs to be in different stages of incubation, and suggests that this may result in partial protection of the eggs, for they brood as soon as the first egg is laid, and some time may elapse between the laying of the first and last egg. The nest is a shallow scrape which may or may not be lined with bits of reed and other debris. Three to four eggs are laid, putty, stone, or slightly olive in ground colour, thickly spotted with black and sepia with underlying marks of greyish. Average measurements  $40 \times 28\frac{1}{2}$  mm. There is as much variation in these eggs as in those of the Lapwing of Europe. I have watched these birds brooding, usually they sit with head well drawn in on the back, but occasionally the head is laid flat, with neck partially stretched and chin on the ground. Though so conspicuous when standing upright, they harmonise wonderfully with





SADDLE-BACKED SPUR-WINGED PLOVER (*Hoplopterus armatus* Burch.)



the ground when they are incubating. They feed on various insects, both larvae and imagoes, including diptera, beetles and termites. They take most of their food along the water's edge, however, and here they capture small crustacea and molluscs. Stomach contents also reveal the presence of grass seeds in small quantities.

There is some local migration, but directions and times have not been ascertained with any degree of accuracy. Night flights are recorded from time to time, but most of these refer to passage from one feeding ground to another.

*HOPLOPTERUS ARMATUS*, Burch.    SADDLE-BACKED SPUR-  
WINGED PLOVER.

Ref. : Burchell, Travels, 1, p. 501, 1822.

Type locality : Cape Province.

DISTRIBUTION :

Limited to the lakes of the Rift Valley.

DESCRIPTION :

Forehead and greater part of crown, white; rest of crown and remainder of head, throat, neck and breast to upper abdomen, black; a white triangular patch, apex forward, at base of hind-neck, followed by a black interscapular triangle, apex pointing back and continuous with the base of a further black triangle, these two triangular areas forming a saddle or anchor-like patch on the back; lesser, median and greater wing coverts, very light grey fading to white on the distal edges of the median coverts, and slightly shaded with ashy on the long inner secondaries. Primaries dark blue-black; secondaries basally white, distally blue-black; under wing-coverts and axillaries white; a pronounced spur at the bend of the wing; back black with white tips; rump and upper tail-coverts white; belly and under tail-coverts white; tail feathers, basal two-thirds white, terminal third black, white tipped, except the outermost pair which are mostly white the black being limited to a sub-terminal bar; or the tail may be white with a terminal black bar lessening in width from central pair, outward. Legs and feet black; bill black; eyes crimson. Length of wing, 209-220 mm.

IMMATURE :

Forehead with a narrow white band; chin and throat whitish; light patch on hind-neck dirty white; dark areas on head, sides of breast and dorsum dark black-brown, each feather tipped with sandy to buff, breast rather paler brown; abdomen, vent and under tail-coverts white; wing-coverts pale grey irregularly barred with sepia and sandy tipped,

the barring being most evident on the median coverts and long inner secondaries; primaries black; secondaries black at tips, white basally. Tail as in the adult but dark ends more brownish.

#### JUVENILE :

The nestling in down is mostly white below, with a breast bar of sandy and black mottling; a white neck ring is present, and the forehead is also whitish; crown and dorsum fairly evenly mottled sandy and sepia, the darker colour being predominant in the middle of the crown and as a line down the dorsum.

#### HABITS :

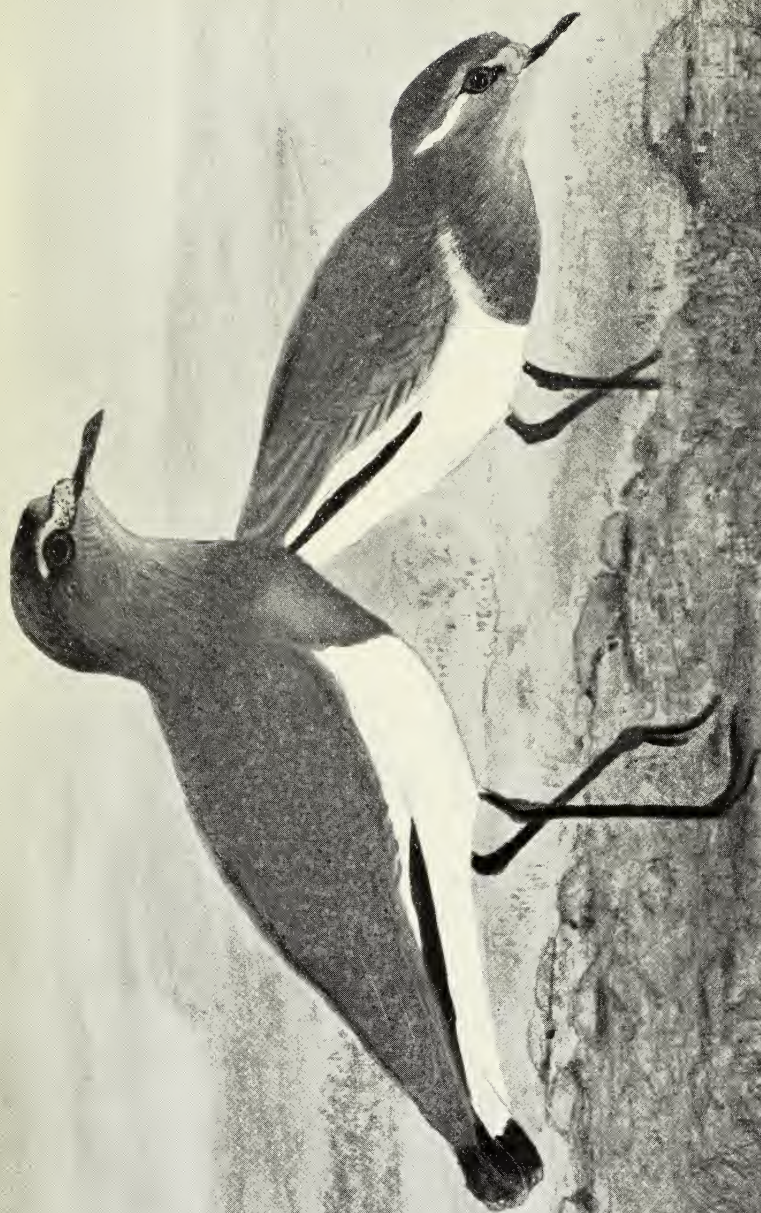
This Plover is frequently referred to as the " Blacksmith " Plover on account of its peculiar metallic call which resembles the sound produced by hitting an anvil with a hammer, hick-hick-hick-hick. They are noisy but mostly so when disturbed or during the mating season. They are always found in the vicinity of or not far from water, frequenting the mud flats or shore where the herbage is very short, or where banks are formed of rotting vegetation and other debris. They will frequent the open grassland, mostly of an evening, where herds of cattle have been grazing, for here they find an abundance of insect food among the dung. They are also partial to grass land that has been burnt off. They are resident where they occur; are usually observed in pairs or family parties, seldom in flocks. They feed almost entirely on insects, small molluscs, crustacea and worms.

The nest is a shallow depression in some slightly raised collection of debris, often not far from the water's edge, and may or may not be lined with bits of debris. Sometimes the nest is on a slightly raised ridge of gravel with sparse vegetation, which marks a former lake-level. Two to four eggs are laid, usually the former; putty, stone, or olive in ground colour with numerous black and umber blotches and some underlying marks. Size average  $40 \times 29$  mm. When the parents have been disturbed from a nest or young, they will fly around giving vent to their metallic cries, and swoop down at the intruder, as do Lapwings at " Home." They flight of an evening from one feeding ground to another, from the water's side to some open grass flat if a strong wind is blowing and the water is rough.

When hunting for larvae in the dung of cattle they turn over the edge of a " pad " with a sharp lateral movement of the bill, and if the " tail " end of a grub is seen they seize it, and setting their weight back will exercise a gentle strain until the creature lets go, when the grub is dropped, picked up, head in bill, and down it goes!







Adult

Immature

CHESTNUT-BANDED WATTLED PLOVER (*Anomalophrys superciliosus* Reichw.)

Genus *ANOMALOPHRYS*.

*ANOMALOPHRYS SUPERCILIOSUS*, Reichw. CHESTNUT-BANDED WATTLED PLOVER.

Ref. : Reichenow, J. Ornith., 1886.

Type locality : Marungu, West Tanganyika.

DISTRIBUTION :

Kenya; limited, so far as our knowledge goes, to the eastern side of Lake Victoria; also to be found in the Kikorongo district of Uganda.

DESCRIPTION : MALE AND FEMALE, ADULT.

Frontal band cinnamon, followed by a blue-black crown ending in a nape crest. Chin dirty-white shading to ashy-grey, which colour extends over the throat and upper breast, cheeks, and side of the neck. This in turn shades into an ashy-olive on the mantle, scapulars, lesser and median wing-coverts and long inner secondaries, all these feathers with rusty tips. The greater coverts are more ashy-grey and have white margins to tip and outer web; primaries blue-black; secondaries white with broad black ends lessening in width from out inwards. Back and rump darker olive-ashy, upper tail-coverts white. Tail white with black bar at end lessening in width from central pair outward, all with white tips. Lower breast and belly to vent and under tail-coverts white. Legs and feet blackish; bill black, tip crimson-purple at base; eyes brown. Wattle and eyelids yellow to orange. Length of wing 184-186 mm. No spur on wing.

IMMATURE :

Somewhat like the adult. The cinnamon of the forehead extends back much further over the crown and passing over the eyes forms a wide supercilium; the crown of the head is similar to the mantle—olive-ashy-brown but less olive than in the adults; posterior to the eye is a whitish line; the throat is dirty white, shading to grey on the sides of the head and neck where it changes to ashy-grey with an ochreous wash on the upper breast. Very often the breast is mottled with chestnut as moulting takes place. Rest of the body plumage as in the adults.

Juvenile in down is unknown.

HABITS :

The Chestnut-breasted Wattled Plover is a rare species and has seldom been taken. In Kenya, I have obtained examples in the south Kavirondo area in which district it breeds; in Uganda, the only locality in which the species is noted, is round Kikorongo, north of Lake



Edward. There is just a possibility that the species will be found to differ geographically when more material is available. Practically nothing is known regarding its habits, and certainly nothing about its nest and eggs. My only evidence that it breeds in the south Kavirondo district is that three-quarter grown young, in first feather, were seen with their parents on the Kano flats. They were of such an age that they could not possibly have migrated there.

The species frequents the open grass lands where the vegetation is stunted and sparse, or on plains where the grass has been burnt off. Stomach contents revealed the presence of insects and small molluscs only. Their general behaviour is similar to the Grey-breasted Plovers.

### Genus *AFRIBYX*.

*AFRIBYX SENEGALLUS SENEGALLUS*, Linn. SENEGAL  
WATTLED PLOVER.

Ref.: Linnaeus, Syst. Nat., 10th, Ed., 1766.

Type locality: Senegal.

DISTRIBUTION: Uganda.

This race is mentioned here to emphasise the fact that the typical nominate form occurs in the north-western districts of Uganda, both true to type and in an intermediate form between it and the southern *A. s. lateralis*. The chief point of difference is that the western race has no smoky to black on the flanks and the belly. The habits of the races will be mentioned together.

*AFRIBYX SENEGALLUS MAJOR*, Neumann. ABYSSINIAN  
WATTLED PLOVER.

Ref.: Neumann, Orn. Monatsb., vol. 22, 1914.

Type locality: Mareb River, Abyssinia.

DISTRIBUTION:

Northern Frontier, Kenya and Jubaland.

DESCRIPTION:

This race is very similar to the next geographical form to be dealt with. It differs in lacking the dark areas to the flanks and upper belly and by its larger size. Wings 235-251 mm.





BLACK-FLANKED WATTLED PLOVER (*Afribyx senegallus lateralis* Smith.)



*AFRIBYX SENEGALLUS LATERALIS*, Smith.      **BLACK-  
FLANKED WATTLED PLOVER.**

Ref.: Smith, Illust. Zool. S.Af., Aves., 1839.

Type locality: Natal.

**DISTRIBUTION:**

The greater part of Uganda; in Kenya mostly restricted to the districts east of Lake Victoria, and southern Masai, Ukambani and the Tana region.

**DESCRIPTION:**

Forehead and fore part of crown pure white, distally bordered by black, which in turn shades off into smoky-ashy-brown dark streaked; the hind neck is lighter in ground but is still streaked; chin white; throat patch black; surrounded by the black and white streaked areas of the side and lower throat; ear-coverts finely streaked black and white; lores covered by a yellow to orange red double wattle, lower long and pendant, upper rounded and erect; eyelids yellow. The whole of the breast smoky-ashy-grey shading to black on the mid-flanks, this colour often extending over the upper belly; abdomen and thighs white; under tail-coverts white with isabelline wash; interscapular region, scapulars and long inner secondaries olive-ashy; lesser and median wing-coverts light ash-grey with buffy tinge shading to white distally; greater coverts white mostly, basally ash; primaries purple-black, white at extreme base; secondaries mostly white with distal black, long inner secondaries white basally ash distally; back and rump olive-ashy, upper tail-coverts white. Tail feathers basally white with black bar at ends lessening in width from within-outward, tips white. Legs and feet light yellowish-olive, greenish-grey; bill olive-yellowish at base, black tipped; eyes lemon-yellow. Wings 220-237 mm. Spur present on bend of wing.

**IMMATURE:**

Somewhat like the adults but without the white frontal patch; the black of the crown is missing so also the black throat line, and there is little trace of the dark colour on the flanks.

**JUVENILE:**

Unknown to me in the downy stage. In first feather, they have most of the mantle, breast and wing-coverts tipped with rusty and sandy colour, and are thus mottled and barred.

**HABITS:**

The Wattled Plovers, in the various geographical races, are here taken together, as their habits are alike. Throughout their distribution

in East Africa, they are only to be found at altitudes under 5,000 ft. so far as I know. The type of country frequented is one where vegetation is sparse and the grass short. They are not limited to the vicinity of water, for we have noted them in places where no water existed for at least 10 miles. Insect food is their principal diet, very largely coleoptera, but when found near lakes and pans various aquatic forms predominate. Like many of the other Plovers, these birds also consume a certain amount of grass seeds.

They are noisy and give warning to all and sundry at the slightest signs of danger, particularly so when they have nests or young. When in flocks composed of two or three families, they are less inclined to be vociferous unless approached too close or too suddenly.

The exact nesting seasons are not yet well known. We have noted eggs in the months of March—June (Kenya), August and September in Uganda. The nest is a shallow depression with scanty lining; two to three eggs, occasionally four, are laid. They are putty to pale olive-brown in ground colour blotched and marked with black and dark brown. Average measurements  $43 \times 30$  mm. The site of the nest is usually on a slightly raised patch of ground or collection of debris.

So far as we have observed, there are no outstanding points of difference in the behaviour of these birds to others of the group. Here again, we have noted evidence of local migrations but the influencing factors are unknown nor is there any information as to exact time and directions. Much more observation needs to be carried out.

### Genus *SARCIOPHORUS*.

#### *SARCIOPHORUS TECTUS TECTUS*, Bodd. CRESTED WATTLED PLOVER.

Ref.: Boddaert, Tabl. Pl. Enlum., 1783.

Type locality: Senegal.

#### DISTRIBUTION:

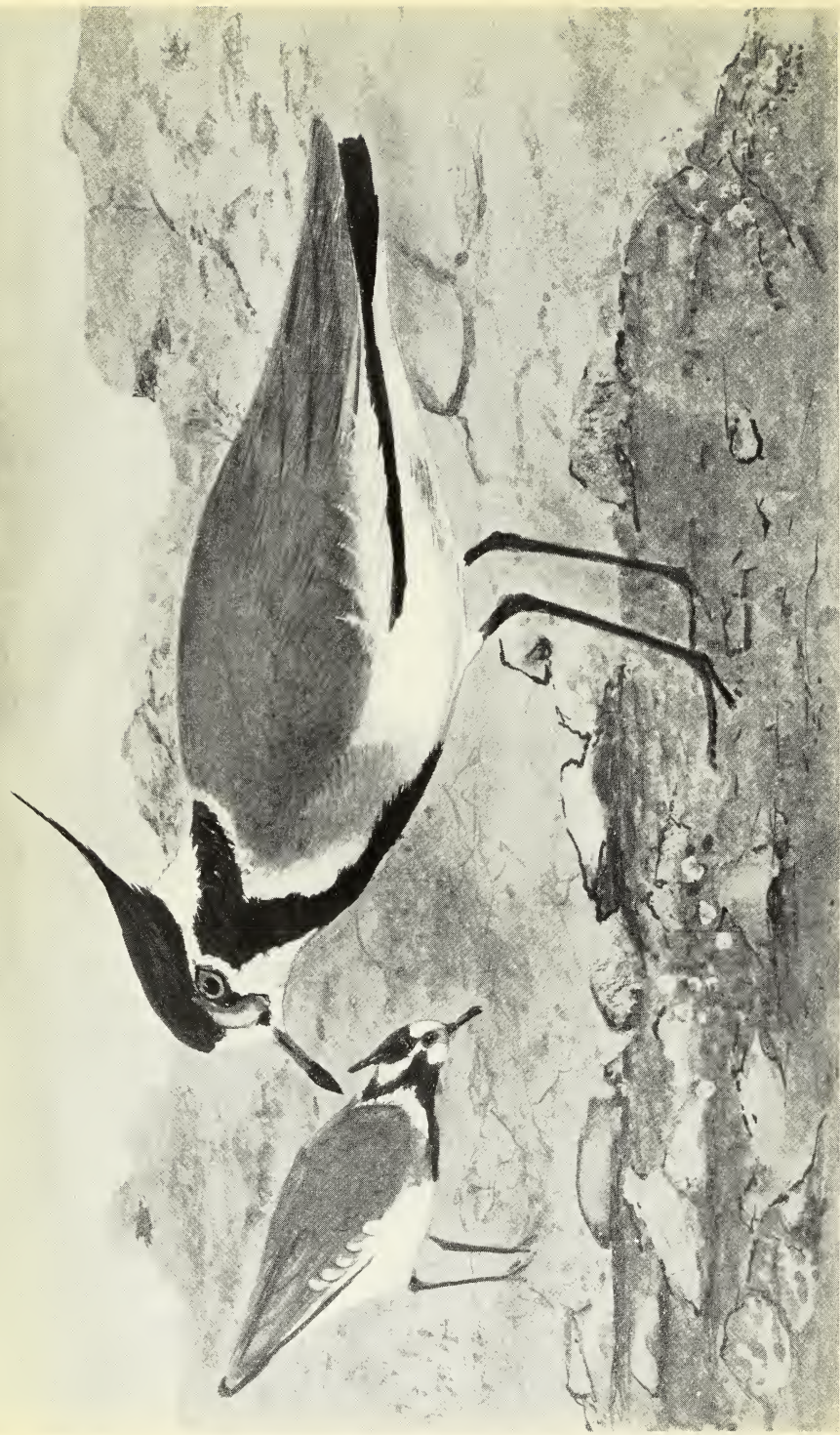
Northern portion of Uganda to South Rudolf to Laikipia and the Northern Frontier of Kenya.

#### DESCRIPTION:

A small frontal patch, chin and upper throat white; rest of crown blue-black, the feathers of the hind-crown elongate and forming a pointed crest; a V shaped white nape line passes forward through the lower eyelid and joins the white throat patch; sometimes this line is broken by the black of the lower throat extending up to the eye. Lores black; an orange to yellow wattle in front of the eye; neck encircled by a black collar, the black colour extending down the centre







s.l. latifrons

CRESTED WATTLED PLOVER (*Sarciphorus tectus tectus* Bodd.)



of the breast as a broad line; on either side of this line the breast may be washed with ashy-grey or it may be uniform white as is the remainder of the underside to as far as and including the under tail-coverts; mantle, scapulars, long inner secondaries and lesser wing-coverts ashy-ochreous-grey; the median wing coverts less ochreous and some tipped white; the greater coverts broadly tipped white forming a conspicuous white wing bar in conjunction with the white of the secondaries; primaries, basal half white terminally black; secondaries white proximally with black distally, the black decreasing in width from out-inwards; back and centre of rump ashy-grey; upper tail-coverts white; tail feathers basally white with black bar at end decreasing in width from central pair outward, all white tipped. Legs and feet plum-red or crimson; bill red at base, tip black; eyes yellow to orange. Length of wing, 180-190 mm. A small spur is present on the " bend " of the wing.

#### IMMATURE AND JUVENILE:

Immature birds have the front of the head dirty white; the black areas are replaced by dark brown feathers tipped with rusty and sandy, the mantle and wing-coverts tipped with sandy and buff, the inner secondaries with some dark barring. No crest on the hind crown. The juvenile in down is unknown to me.

#### HABITS:

I propose to deal with these jointly under the next race.

#### *SARCIOPHORUS TECTUS LATIFRONS*, Reichw. SOMALI CRESTED WATTLED PLOVER.

Ref.: Reichenow, Orn. Centralbl, 1881.

Type locality: Bardera, S. Somaliland.

#### DISTRIBUTION:

From the Juba River to the Tana, and South Ukambani.

#### DESCRIPTION: MALE AND FEMALE.

Very similar to the previous race. The chief point of difference is in the greater width of the white frontal which extends back as far as the mid-point of the eyes. The general tone of the upper surface is paler; the ashy wash on the sides of the chest is more distinct and the size is smaller. Wings vary from 163-180 mm. The colour of the legs and feet are brighter red.

#### HABITS: (Both races).

This species is restricted in its distribution to those areas which are low-lying, i.e., below 5,000 ft. and during the non-breeding season

they are to be found in semi-arid country. Their general behaviour is very like that of the European Lapwing. They have the same curious habit of "tailwagging" when they have just alighted from a short flight. They are noisy and apt to be regarded as a nuisance if one is stalking game; for their cries give warning to all in the neighbourhood. They are not timid by any means, and will allow one within reasonable distance, merely walking slowly away as one approaches, but all the time they keep calling. Their call is very similar to that of *S. lugubris*, perhaps less harsh.

So far as I am aware, the nest and eggs of this species have not been recorded from these territories. Eggs taken in the Sudan are putty to earthy brown in ground colour blotched with dark brown and black. Breeding birds have been shot in June.

### Genus *HEMIPARRA*.

#### *HEMIPARRA CRASSIROSTRIS CRASSIROSTRIS*, Hartl. WHITE-SHOULDERED THICK-BILLED PLOVER.

Ref.: Hartlaub, Jrl. Ornith., 1855.

Type locality: Nubia.

#### DISTRIBUTION:

The northern portions of Uganda to Rudolf.

#### *HEMIPARRA CRASSIROSTRIS HYBRIDA*, Reich. NYANZA WHITE-SHOULDERED THICK-BILLED PLOVER.

Ref.: Reichenow, Orn. Monatsb., 1909.

Type locality: Tanganyika Territory.

#### DISTRIBUTION:

The country east and south of Lake Victoria.

#### DESCRIPTION:

The whole of the head (except the nape) and the throat pure white, followed by blue-black which encircles the back of the neck, the sides and the breast; abdomen white so also the under tail-coverts except the two longest which have large black lateral areas subterminally. Mantle, scapulars and long inner secondaries smoky-grey, the last becoming darker and strongly washed with grey-green; primary coverts pure white; lesser and median coverts also white; primaries blue-black; secondaries black and white, the distal black increasing from in-outwards; back ashy-grey becoming darker, almost black at centre of



NYANZA WHITE-SHOULDERED PLOVER (*Hemiparra crassirostris hybrida* Reichw.)





rump; upper tail-coverts white; tail feathers basally white, distally black, the central pair with very little white. Legs and feet carmine to red with dark blackish scutes on the tarsi and toes; bill red with a black tip; eyes red so also the eyelids. Wings measure 200-212 mm. A small spur is present at the "elbow."

#### IMMATURE AND JUVENILE:

These are unknown to me.

#### HABITS:

This species is almost entirely confined to the vicinity of water, indeed, they seem to spend quite a fair proportion of their time on floating islets and debris as well as along the water front. Furthermore, many of their nests are to be found on these islets. They are to be met with in pairs during the breeding season, and in small companies at other times, but not in very large flocks. During the "off-season" they are wary and dislike a close approach, but when with nest or young they exhibit a certain degree of boldness in their anxiety to protect their property. One may be certain that a pair is nesting, yet have some difficulty in locating the eggs. MacInnes records that one seldom has the opportunity of observing a brooding bird; this is due to the fact that the parent bird slips off the nest at the first sign of danger and runs off some distance. If they are flushed they fly a certain distance and circle back towards the spot. One has to go over the likely ground very carefully before the nest is found. As already mentioned, the nest is often on an island or raised platform of debris and the nest itself is made of debris and, according to MacInnes, sometimes mosses. Usually two eggs are laid, occasionally three, putty to earth-brown in colour rather heavily blotched with dark brown and black.

## NOTES ON THE BIRDS OF TURKANA PROVINCE.

By D. G. MAC INNES.

Member of the Lake Rudolf Rift Valley Expedition, 1934.

### *Introduction.*

The following notes on the birds of Turkana were collected by the Lake Rudolf Rift Valley Expedition, which was working in the province from February 10th to May 18th, and for a short time during September and October.

Since the study of Ornithology was only one of the side issues of the Expedition, the collection made, and the notes obtained, are necessarily very incomplete. They may, however, serve to show that a more detailed survey of the birds of the Lake Rudolf area, made over a longer period of time, would add most valuable information with regard to the nesting habits and the migrational movements of many birds whose habits are at present not well known.

The only place where any detailed work could be carried out by the Expedition was Ferguson Gulf, but even here, the time available was all too short. In April and May, the level of the lake was sinking fairly rapidly and at this point, owing to the shallow nature of the shore, the water was receding at a great pace. Along the western shore of the Gulf the water receded sixty yards between February 20th and April 14th, and another ten yards between April 14th and 25th. As a result the vegetation could not keep up with the water line, and there was a considerable expanse of muddy or sandy shore, which afforded no cover and very little food.

At this period, the majority of the Flamingoes, Pelicans, Waders, Terns and Gulls congregated each night at the south end of the Gulf where a considerable area of shore had become an almost impassable swamp, probably as a result of the constant movement of the birds.

In September, owing to heavy rains in the region of Mt. Elgon, Mt. Moroto, etc., many rivers, which for the greater part of the year are dry, had been flowing for some weeks, and the level of the Lake had risen two feet, and encroached nearly a quarter of a mile.

The coarse grass which had previously been separated from the water's edge by a hundred yards or more of dry sand, now stretched well out into the lake affording both cover and food for the birds, and several new arrivals were observed which had not been present earlier in the year. Amongst these were the European Glossy Ibis, the Wood Ibis, several Herons and Waders.

The roosting ground at the south end of the Gulf being under water, the birds no longer congregated in any one place, but passed the night apparently wherever they happened to be. Whether these changes depend in any way on the rise of the lake level and the corresponding alteration in the shore line, or whether they are controlled by migrational movements, regardless of climatic conditions, it is at present impossible to determine until a more detailed investigation can be carried out.

The ornithological material collected by the Expedition, numbering in all some two hundred skins, has been donated to the Coryndon Memorial Museum, Nairobi, where the greatest assistance has been rendered in the identification of specimens by Dr. van Someren. The system employed in these notes follows that of Dr. van Someren in his "Notes on the Birds of East Africa." (Novitates Zoologicae, Vol. XXIX, Apl. 1922, No. 1, & Op. cit. Vol. XXXVII, 1932.)

#### *Systematic list and field notes.*

#### AFRICAN LITTLE GREBE (*Polioccephalus ruficollis capensis*, Salvad.).

Not often seen owing to the lack of suitable environment. The two males obtained were shot at Ferguson Gulf on April 12th from a party of four birds. It was never seen on the open lake, apparently preferring the smaller pools of water a quarter or half a mile inland. The birds were found to be very reluctant to fly, even when hard pressed. They dived continually and remained under water for a considerable period. The old theory that the Grebe follows, under water, the direction in which its bill was pointing before diving, certainly does not hold good with this species, as the bird would often appear in exactly the opposite direction.

#### GREY-HEADED GULL (*Larus cirrocephalus*, Vieill.).

Fairly abundant along the western shore of Lake Rudolf, where during the day they were generally found to occur singly. Toward sunset, they were inclined to gather into small groups before roosting, and at dark they were to be seen working along the shore by short stages to the roosting grounds. At the south end of Ferguson Gulf there was a common roosting ground where a great many varieties of water-birds congregated every night.

#### WHITE-WINGED BLACK TERN (*Chlidonias leucoptera*, Temm.).

Very common, occurring in large flocks along the lake shore. Of the specimens obtained, two females are in full plumage; 15th and 16th April. One male is in nearly full plumage, and two are immature, first year birds; 2nd March, 16th April. In February and March, near the north end of Lake Rudolf, only immature birds were seen, and these never in flocks, but in small parties. Throughout the day, they were



to be seen feeding along the shore, but with no particular directional trend. At Ferguson Gulf, in April, they were present in very large numbers, and both mature and immature were obtained. During the mornings the majority rested on the shore, but at about 3 p.m. each day they would all start feeding, gradually working outwards over the lake throughout the remaining hours of daylight. At sunset the birds would again congregate, large numbers moving down to the main roosting ground, while a few smaller parties would pass the night at certain fixed points on the shore.

No indication of breeding was observed at this season or at any time. By the middle of September practically all the birds had assumed winter plumage, though a few were noted which showed a large proportion of the black breeding dress. During the next few weeks even these disappeared and by the middle of October no birds were seen with any trace of black.

At this time of the year a marked change in habits was observed; enormous numbers of terns came inland every afternoon, where for several hours they were seen hawking over the grassy margin of the lake in pursuit of grasshoppers and insects. They would sometimes go as much as two miles inland.

At dusk they were not seen to congregate into flocks, nor was any concerted movement toward a roosting ground observed; many of the birds continuing their search for food long after dark, eventually roosting individually, and not in flocks.

It seems probable that the change in feeding grounds between April and September would be due to a local migration of the fish since the abundance of grasshoppers along the lake shore had certainly not increased in the latter season but had, on the whole, decreased.

#### GULL-BILLED TERN (*Gelochelidon nilotica*, Gmel.).

A female obtained at Ferguson Gulf on April 4th is in full breeding plumage though the ovaries were not unduly enlarged and no other indications of breeding were observed. At this season the birds were fairly frequently seen along the shore, but only solitary individuals which were never seen to mix with the smaller terns or with the gulls. With one exception, every bird seen in April was working gradually southward, though whether this has any significance is not clear, for since this species has hitherto been considered as only a winter visitor to East Africa, one would have expected any April migration movement to be northward.

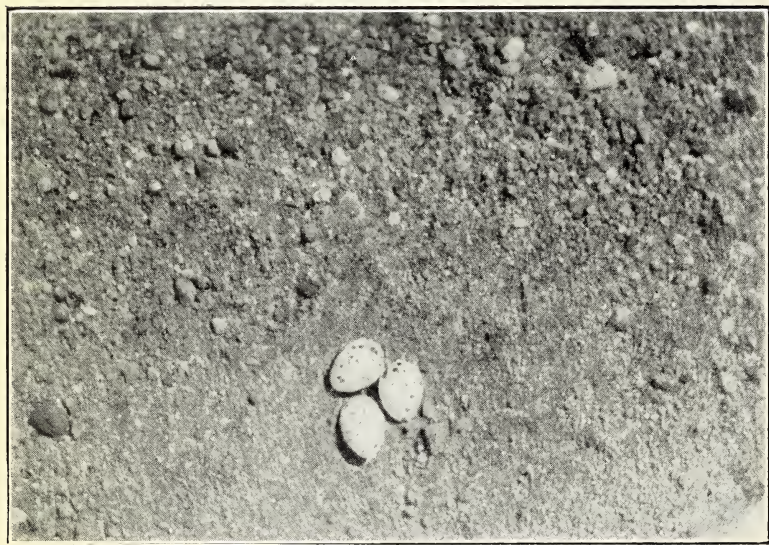
By the middle of September, the numbers of Gull-billed Terns had increased enormously, due to an influx of birds from the north. In some cases they were found congregated into flocks of thirty or more, particularly at the mouth of the Turkwell River where several flocks were to be seen, numbering in all some hundreds of birds.







*Nest of Kite (Milvus m. parasiticus).*



*Nest and eggs of Scissorbill (Rhynchops flavirostris).*

At this season they seemed to become more sociable in their habits, and mixed freely with the White-winged Black Terns. All the birds observed in September and October had assumed winter plumage, and their movements showed no directional trend. A female in winter dress was obtained at Ferguson Gulf on September 23rd.

#### SCISSOR-BILL (*Rhynchops flavirostris*, Vieill.).

No Scissor-bills were seen until April 17th when a single bird appeared in Ferguson Gulf; the following day three birds were noted, and during the ensuing week many more were observed.

On April 25th, a nest was found at Ferguson Gulf, containing one fresh egg. The nest consisted of a fairly deep scrape some nine inches in diameter, in loose, dry sand close to the water's edge, and was entirely unlined. Numerous other scrapes were found at the same spot, but none of these contained eggs. On Central Island where the birds were very common, they commenced to lay on April 27th, and during the next few days a great many nests were found, with clutches of two and three eggs. The general appearance of these eggs is very similar to those of the Common European Tern (*Sterna hirundo*, Linn.) and in size also they agree very closely. The average measurements of seven eggs is  $40.1 \times 28.9$  mm. as opposed to  $40.9 \times 30.3$  mm. in the case of the Common Tern. The general colour is perhaps a trifle darker. The ground colour is sandy buff spotted and blotched with dark brown.

By September the numbers of Scissor-bills had very greatly increased, several thousands being present in the Ferguson Gulf area alone. On Central Island a number of immature birds were seen on September 25th some of which were only just able to fly, which suggests that possibly some pairs rear two broods in the season. The enormous increase in numbers, however, cannot be accounted for solely by the success of the breeding season, but must also represent another immigration of birds from elsewhere. The birds were always found to be very tame and quite unafraid of man, and like the Terns, they became very noisy when disturbed at their nesting sites.

The call is generally a shrill whistle, though occasionally a harsher note similar to that of the Terns is also heard.

#### COMMON PELICAN (*Pelecanus onocrotalus*, Linn.).

Very common along the lake shore, particularly in Ferguson Gulf and on Central Island. No signs of nesting were observed in the spring but on September 26th, a nest was found on Central Island containing a nearly fledged young bird and a second dead bird.

The nest was a coarse structure of sticks, situated about ten feet from the ground in a small tree. On the same day, another bird was seen carrying nesting materials, though no other nests were found.



Since the conditions were suitable and the birds numerous, it seems likely that at the right season they might be found nesting in large numbers on the Island.

**EAST AFRICAN CORMORANT** (*Phalacrocorax carbo lugubris*, Rupp.).

A female obtained at Ferguson Gulf on April 20th is in full breeding dress, and the ovaries were well developed, having two nearly ripe ova. No nesting sites were observed in the locality, probably on account of the unsuitable surroundings. It is clear, however, that the birds do nest somewhere on Lake Rudolf, probably on Central Island where they are very plentiful. Only a few specimens were seen in the Gulf.

**PIGMY AFRICAN CORMORANT** (*Phalacrocorax africanus africanus*, Gmel.).

The Pigmy Cormorant also occurred in large numbers in the Gulf during April, flocks of several hundred birds being observed amongst which were both adult and immature. These flocks were generally accompanied by a few AFRICAN DARTERS (*Anhinga rufa rufa*, Lacep. & Daud.) but no specimens of either were obtained.

**ANATIDÆ.**

No specimens of Duck were preserved, but the following were seen or obtained at Ferguson Gulf.

**CAPE TEAL** (*Anas capensis*, Gmel.). **GARGANEY TEAL** (*Anas querquedula*, Linn.).

**EUROPEAN SHOVELER** (*Spatula clypeata*, Linn.).

**WHITE-FACED WHISTLING TREE DUCK** (*Dendrocygna viduata*, Linn.).

**FULVOUS WHISTLING TREE DUCK** (*Dendrocygna fulva*, Gmel.).

All the Ducks were as a rule exceedingly difficult to approach owing to the open nature of the lake shore. From February to April the first three species occurred in fair numbers, the Cape Teal and the Garganey often being seen together while the Shovelers remained by themselves. An evening flight took place, but its direction was variable and it was not ascertained whether the birds congregated at one roosting place. During April the number of Shovelers was appreciably on the increase and on April 22nd several packs were seen with about fifty birds in each. Up to April 24th or perhaps a little



later, any of the three first species were to be found at certain points on the lake shore, but no Tree Ducks were seen. Returning to the same locality on May 10th, all the points were again visited but none of these duck were found, while Tree Ducks were present in very large numbers. The Shovelers and Garganey had migrated northward to Europe while the Cape Teal had moved off to more favourable feeding or breeding grounds.

In September again, only Tree Duck were seen in Ferguson Gulf, the first indication of the return migration of the European ducks was on September 27th, near Ely, when four Shovelers were seen.

These were extremely wild and it was impossible to see the condition of their plumage. Another party of twenty were noted on October 7th at the north side of the Turkwell delta. Returning to Ferguson Gulf on October 8th it was found that all five species of duck, as first recorded, were present, with an apparent decrease in the number of Tree Duck.

#### EGYPTIAN GOOSE (*Alopochen aegyptiacus*, Linn.).

Very common at all points visited on the Lake shore, particularly in Ferguson Gulf and Central Island. In April and May these birds were always seen in pairs, and on April 28th a nest containing eight eggs was found on Central Island, and while no other nests were found, several pairs appeared, by their behaviour, to be nesting.

By day, in Ferguson Gulf, many pairs would be seen on the shore, but towards evening from 4-30 p.m. onwards the majority of these would fly inland to a patch of grass land where they gathered into large flocks, feeding fearlessly amongst goats and donkeys, and in some cases even allowing native children to approach within a few yards of them. If undisturbed the geese would remain here at least until dark, but they had always dispersed again by daylight.

On September 25th, several pairs were found on Central Island with newly hatched young, but no pairs had more than three young birds, which may possibly have been a second brood.

At the mouths of the Turkwell River on September 28th and 29th, large quantities of Geese were found congregated into flocks numbering hundreds of birds, though nowhere else were such large flocks seen. On October 6th a party of nine birds was found which though apparently fully fledged were still unable to fly.

#### EUROPEAN GLOSSY IBIS (*Plegadis falcinellus*, Linn.).

None were seen in April and May, but in September they were present in Ferguson Gulf in large numbers. The birds were never seen singly, but only in large flocks of fifty to sixty individuals.

No indications of nesting were observed.

### SACRED IBIS (*Treskiornis æthiopicus æthiopicus*, Lath.).

This species was also found to be present in considerable numbers in September, whereas earlier in the year only a few birds had been seen. The increase in the numbers of both this and the previous species may have been due to the rise of the lake, altering the shore from bare sand to grassy swamp conditions.

### AFRICAN SPOONBILL (*Platalea alba*, Scop.).

Occasionally seen in small parties but on the whole not very common. A nesting colony was found on Central Island on April 28th, most of the nests containing three fresh eggs. These are white, with irregular smears and spots of reddish-brown. The average measurements of ten eggs was  $66.8 \times 43.4$  mm. The nests were situated amongst the rocks close to the water's edge, though in some cases no attempt at a nest was made, the eggs being laid on the bare rock. No specimens of the birds were collected.

### GIANT HERON (*Ardea goliath*, Cretzschm.).

During the month of April, Giant Herons were noted in fair numbers on Central Island, though they were but seldom seen elsewhere.

A nest was found on April 28th containing one newly hatched chick and one egg. No other nests were seen. In September a marked increase in the numbers of the bird was observed in Ferguson Gulf and they were extremely plentiful round the delta of the Turkwell River and at several points on the west shore of the lake. Another nest was found on Central Island containing two half-fledged young, on September 26th. The nest was situated on the ground amongst large boulders, about 15 yards from the shore. It consisted of a large structure of sticks about two and a half feet in height and four feet in diameter.

The young birds at first lay close, but later left the nest, and attempted, quite unsuccessfully, to hide among the rocks.

The plumage of the young birds was very similar to that of the adult, but the permanent feathers were partly obscured by long dark grey down, while large areas of the skin remained bare.

The parent birds remained at a distance of about a hundred yards and showed no agitation. No other nests were found though the birds in the vicinity were all standing in pairs, whereas at all other places they were found singly.

### MARABOU STORK (*Leptoptilus crumeniferous*, Less.).

Not common. No birds were seen in the Spring, but a few were observed at Ferguson Gulf in September. They had been noted in fair numbers on the eastern shore of the lake in August in conditions very similar to those of the Gulf, and the reason for their scarcity on the western shore is not clear.



Nest of Goliath Heron.



Young Goliath Heron leaving nest.





## WOOD IBIS (*Ibis ibis*, Linn.).

No birds were seen in April or May, but in September they were present in considerable numbers along the whole of the western shore of the lake, from Ferguson Gulf to Lolelia, including Central Island. On September 26th a large nesting colony was found on the island, but this could only be examined from a distance with the aid of binoculars. The nests which must have numbered several hundreds, were situated in trees and bushes growing from the side of a cliff and in some cases were placed on rocky ledges.

In some nests, newly hatched young could be seen, and in others the parent bird was sitting very close, apparently incubating eggs. Unfortunately time did not allow of a closer investigation of this colony, and neither specimens of the birds nor eggs were obtained.

## EUROPEAN FLAMINGO (*Phoenicopterus ruber antiquorum*, Temm.) LESSER FLAMINGO (*Phoeniconaias minor*, Geoff.).

Both species of Flamingo were present in very large numbers, particularly in Ferguson Gulf, where a female of *P. r. antiquorum* was obtained on October 9th. During the day small parties, and also large flocks were to be found feeding along the water's edge. In April, it was noticed that at sunset enormous numbers congregated at the south end of the Gulf, coming in an almost continuous stream from the north for about half an hour after sunset.

A similar reverse flight took place each morning between 5 a.m. and 6 a.m. Thus the number of Flamingoes in the Gulf by night must have been five or six times as great as that during the day.

In September and October, the roosting ground was swamped owing to the rise in the level of the lake, and at this season, it was found that the birds no longer congregated at any one point to roost, but passed the night in small parties scattered along the whole of the shore. Also, there was no apparent influx of birds at night, the numbers in the Gulf remaining constant both by day and night. No indications of nesting were observed, and the female obtained showed no enlargement of the ovaries, but it is possible that in September many birds had congregated at more suitable places in order to breed, which would account for the very marked change in their daily movements. It is probable that the Lesser Flamingo does breed on the Lake, but there is no evidence to show that the European bird does so.

## EAST AFRICAN PRATINCOLE (*Glareola pratincola fulleborni*, Neum.).

The Pratincoles seemed to be constantly on the move, seldom frequenting any one locality for a long period. Near the north end of the lake on March 3rd, six males were obtained, and a great many birds were seen, where for the preceding week there had been none.

At Ferguson Gulf in April, the same thing was observed, the birds being present on some days in large numbers and at other times entirely absent. Six specimens, five males and one female were taken at the Gulf on April 13th and 15th.

Examination of the stomach contents showed that the birds had been feeding largely on Tiger beetles (*Cicendelidæ*).

At the end of September the birds were far more numerous in Ferguson Gulf, but on October 8th to 10th none were seen.

The series of skins obtained agree very closely with the race *G. p. fulleborni*, and are recorded as such. In the Bulletin of the United States National Museum (Bull. 153, pp. 192) Friedmann includes a series of birds from the south of Rudolf, as *G. p. limbata*, but he admits that they are intermediate between *limbata* and *fulleborni*. The wing measurements of the present series ranges from 176-192 mm.; average 185 mm.

#### SOMALI COURSER (*Cursorius cursor somalensis* $\geq$ *littoralis*).

Fairly frequently seen in the sub-desert country north of the Turkwell River, but nowhere very common. The birds were nearly always found at a considerable distance from water, apparently preferring the dry country. Only on one occasion were they seen to drink at the lake, when a party of eight birds came down to drink with the Pin-tailed Sandgrouse.

On September 22nd a pair were seen near Ferguson Gulf with two half-fledged chicks still unable to fly.

#### THREE-BANDED COURSER (*Rhinoptilus cinctus cinctus*, Heugl.).

Not very common. A single male, brought in with two eggs by natives, on April 2nd was the only specimen seen in the Spring. The bird was said to have been trapped at the nest, and since the eggs appear to be those of a Courser, this is probably correct.

The eggs have a sandy ground colour, closely speckled and lined with dark brown, and showed about two days incubation. The measurements are as follows: 36 x 24, 35 x 24 mm. Two other pairs were seen at Lodwar in September, and a pair was obtained on September 18th, but no further signs of nesting were observed and no other birds were seen in Turkana.

#### EGYPTIAN SPUR-WINGED PLOVER (*Hoplopterus spinosus*, Linn.).

Fairly common in certain localities on Lake Rudolf. The female obtained was shot near the north end of the lake on March 3rd.

No indications of nesting were observed on the west side, but a nest was found on the eastern shore on August 28th containing three nearly fresh eggs.

SOMALI SPOTTED STONE CURLEW (*Burhinus capensis affinis*, Rupp.).

A male shot off a nest on May 9th was the only specimen taken though the birds were fairly frequently seen throughout Turkana, in the drier areas of the country. The nest was situated in loose sand under a low bush, and consisted of a shallow unlined scrape and contained two fresh eggs. These are darker than those of the European species *B. o. oedicnemus*, but in other respects are very similar. They measure 50 × 38, 51 × 38 mm.

EUROPEAN CURLEW (*Numenius arquatus arquatus*, Linn.).

Fairly plentiful on most parts of the lake shore, but everywhere extremely shy and difficult to obtain. At Ferguson Gulf the birds took part in the evening flight with almost all the other Waders, and it was found that at such times they would frequently answer to a decoy whistle, and solitary birds might even be induced to approach to within a few yards. The female obtained was shot at Ferguson Gulf on April 14th. The bill measures 158 mm. (straight).

MARSH SANDPIPER (*Tringa stagnatalis*, Bechst.).

COMMON SANDPIPER (*Actites hypoleucos*, Linn.).

CURLEW SANDPIPER (*Erolia testacea*, Pallas.).

LITTLE STINT (*Erolia minuta minuta*, Leisl.).

GREEN SANDPIPER (*Tringa ochropus*, Linn.).

The first four species occurred in large numbers at all points of the lake shore, where they mixed freely with each other. Of the four, the Marsh Sandpiper was on the whole the most common, and the Little Stint the least common. The specimens obtained were all taken between April 13th and the 22nd at Ferguson Gulf. The movements of the birds here were very erratic, but were apparently not influenced in any way by weather conditions, as is sometimes the case. On some days throughout the morning, small waders of all kinds would be seen passing south in small parties, while on other days at the same time the movement would be northward. In the evenings there was a great movement and many birds probably went down to the roosting place at the south end of the gulf, though a few parties gathered at certain other points on the shore. By May 10th the birds were still plentiful but no indication of nesting was observed amongst any of the Waders. In September, many Common Sandpipers were found in the bed of the Turkwell River at Lodwar, where many pools were left after rains earlier in the year. Males and females were obtained. Several Green Sandpipers were seen but they were very wild and could not be approached.



PIN-TAILED SANDGROUSE  
(*olivascens*).

(*Pterocles senegalensis elliotti*  $\geq$

The specimens obtained represent the intermediate form between *P. s. elliotti* and *olivascens*. They were collected on April 6th. These birds were very common throughout Turkana in the low-lying sub-desert country. East of Mt. Labur, large numbers came down to the lake to drink each morning, at about 7 a.m., the flight lasting about twenty minutes. Here it was noticed that the birds always flew very high until well over the lake when they would circle round and come down to the shore, while on the return journey, they would go straight inland, often only a few feet off the ground. This had no apparent connection with the direction of the wind.

At Ferguson Gulf, the birds began to appear at 6 a.m., the majority gathering about a mile inland, where they remained for an hour or more. By 7 a.m. hundreds of birds had congregated and for the next half hour a steady stream of small parties could be seen passing down to the water's edge, every group drinking at the same stretch of water front about two hundred yards in length. The time taken to drink was extremely short, occupying from 5—15 seconds, very rarely more. It seems curious that although such great numbers collected inland, it was very seldom that more than twenty birds would actually drink together: the usual number would be five to ten birds. It was frequently noticed that birds going down to water would join parties returning, at least for a short distance and apparently in some cases these birds returned without drinking at all. Since the return flight was always considerably faster and appeared to be more determined, the reverse process seldom took place, though on two occasions birds returning from the water were seen to join others going in the opposite direction, and to take a second drink.

When, during the day one came upon these birds inland, they were in parties of at least half a dozen and often more. No indication of nesting was observed in the spring.

At Lodwar, in September, a few individuals were seen to come to the water holes at all hours of the day, sometimes as late as 4 p.m., but it was noticed that these were invariably males and may have been fetching water for their young. A female was seen on September 14th near Lodwar with two unfledged young which were unable to fly.

On October 5—6th, at a point some miles south of the Kerio River mouth, large numbers came down to the lake to drink between 2 p.m. and 3 p.m. each afternoon. In this case both sexes were noted. This was the only occasion when the Pin-tailed Sandgrouse were seen to come in any quantity to drink other than early in the morning.



### BRIDLED SANDGROUSE (*Eremiolector sukensis*).

Probably as common as the Pintail, though less often seen, occurring apparently more in the rocky hilly country rather than on the open sandy plains. Unlike the latter species they drink only in the evenings, commencing to come to water about half an hour after sunset, in groups seldom exceeding six birds. They were only seen drinking at the lake on two occasions, four birds being observed on each occasion. This is probably due to the fact that their different habitat gives them access to neighbouring rock pools. Some waterholes in the dry bed of the Turkwell River at Lodwar were the only ones found which were frequented by both species. During, and after exceptionally heavy rains, at the end of April, and early in May, a few birds continued to come to the regular drinking places, in spite of the fact that the Turkwell was in flood and there was unlimited surface water on all sides. By day, the birds were found only in pairs but no nests or eggs were obtained.

### ORANGE-THROATED FRANCOLIN (*Pternistes leucocephus infuscatus*, Cab.).

Not very common. The female obtained was brought in by a native at Lodwar on April 9th. No other specimens were seen.

### RED-LEGGED BUSH FRANCOLIN (*Francolinus sephæna ochrogaster* $\geq$ *granti*).

Very common in all suitable localities, particularly amongst the thick bush along the banks of the Turkwell River. A clutch of five hard-set eggs brought in by natives at Lodwar on April 4th belong to this species. The average measurement of these is  $39.1 \times 27.8$  mm. The birds were found to be extremely shy and were seldom seen by day, though towards evening they became very noisy and could occasionally be seen when the majority went to roost in the tops of the low palm trees.

### YELLOW-TUFTED BUSTARD. (*Afrotis gindiana gindiana*, Oust.).

Very common in the dry thorn bush country towards the north end of Lake Rudolf, particularly east and south-east of Mt. Labur, where they occurred in large numbers. None were seen further south near Ferguson Gulf, although the conditions were apparently similar. The birds were generally found singly or in pairs, sheltering from the heat of the day under low thorn bushes. The call note has a particularly ventriloquistic quality and is extremely difficult to locate. The specimen obtained was shot at Komogin River south-east of Mt. Labur.

SPECKLED-NECK ROCK PIGEON (*Columba guinea longipennis*, Reichw.).

Common in northern Turkana where there are many rocky gorges, but seldom seen elsewhere. The male obtained was taken at Lokitaung on March 16th. No nests were found.

WHITE-VENTED RED-EYED DOVE (*Streptopelia decipiens permista*).

Very common throughout Turkana. The great majority of the Doves came to drink at the permanent waterholes every morning, while comparatively few were seen to drink in the evening.

At Lodwar large numbers of doves were shot for food and it was noticed that this species occurred in almost equal numbers with the Uganda WHITE-VENTED DOVE (*Streptopelia capicola tropica*, Reichw.). Near Ferguson Gulf also, both species were very plentiful amongst the palm trees about two miles from the lake shore, but none were seen to come to the lake to drink. Apparently these birds were more fastidious than most, preferring to go further afield to obtain water rather than drink the alkaline water of the lake.

The UGANDA BLUE-SPOTTED GROUND DOVE (*Turtur afer sclateri*), the LONG-TAILED GROUND DOVE (*Oena capensis*), and the SPECKLED-NECK DOVE (*Streptopelia senegalensis aequatorialis*) were also plentiful, but no specimens were preserved. Early in May many birds were seen courting and appeared about to nest, but none were found.

WHITE-RUMPED SPARROW HAWK (*Melierax gaber*, Daud.).

The male and female obtained were the only specimens seen during the three months, the female was shot at Lodwar, the male at Komogin River, both in very dry surroundings.

RUFIOUS-BREASTED SPARROW HAWK (*Accipiter badius riggenbachi*, Neum.).

Not common. A specimen was seen at Lokitaung on March 14th and the female obtained was trapped by natives at Lodwar, April 10th. From the localities it would appear that the species prefers the well-wooded districts near permanent water, rather than the sub-desert country frequented by *Melierax gaber*.

BATALEUR EAGLE (*Helotarsus ecaudatus*, Daud.).

Fairly common along the Turkwell, but seldom seen elsewhere. The male obtained was shot whilst collecting and eating baked mud from the dry bed of the Turkwell at Lodwar on April 7th. When examined, the stomach was found to contain lumps of hard mud and in addition three rats and two eggs. The latter had been swallowed

whole and one was still almost intact while the other had lost most of the shell, though the inner lining membrane was still unbroken. The colour of the eyes and also that of the bare skin at the base of the bill and the legs faded rapidly when the specimen was killed, the eyes changing to dark brown, the bill and legs to dull orange within an hour of death.

#### SOUTHERN KITE (*Milvus migrans parasiticus*, Daud.).

Very common at Lokitaung and other parts of the northern Turkana, but less frequently seen in the region of the Turkwell.

A nest found at Lokitaung on March 14th contained two eggs, slightly incubated. It was situated about fifteen feet up in an Olive tree and was constructed of sticks and lined with lumps of mud, dung, and pieces of goat skin. Another nest found on March 24th was still under construction. This was lined in a similar manner but had as an additional delicacy, the dried carcase of a hedgehog.

The eggs are pale green with irregular marks of chestnut brown. Measurements:  $54 \times 42$ ,  $50 \times 40.5$  mm. The sitting bird was found to be extremely timid leaving the nest at the first sign of danger, when she would be joined almost immediately by her mate and the two birds would remain in the vicinity, keeping at a safe distance, until satisfied that all danger was past. Only the male of this pair was obtained and since it showed no incubation patches, had taken no part in sitting on the eggs.

#### AFRICAN SWALLOW-TAILED KITE (*Chelictinia riocourii*, Veill. & Oud.).

This species was found to be very plentiful at Ferguson Gulf but none were seen elsewhere in Turkana.

The male obtained was shot on April 14th. They were always seen along the grassy margin of the lake in pursuit of grasshoppers which appear to be their staple diet. Their method of hunting is not unlike that of the Kestrel, the birds flying slowly and fairly low over the ground, continually hovering and dropping on to their prey. The stomach contents consisted solely of grasshoppers. When hunting they were not at all timid and could be approached with ease.

The birds present rather an unusual appearance in flight when seen from below; the underparts are pure white or very pale grey thus the outline becomes very indistinct against a bright sky. The most conspicuous feature is an oval black spot on the under side of each wing.

#### PEARL-SPOTTED OWL (*Glaucidium perlatum*).

A specimen was seen for the first time at Lodwar on April 29th. The following morning it was again seen when it killed a bat, afterwards retiring with it to a patch of thick bush where it was mobbed by Bulbuls



and Warblers. The bird obtained was shot on May 1st after which no more were seen.

UGANDA YELLOW-SHOULDERED PARROT (*Poicephalus meyeri saturatus*, Sharpe).

Quite common along the Turkwell where they were seen in pairs; but none were seen at Lokitaung or elsewhere in the north.

At Lodwar a pair was reported to be nesting in April, but this was not verified. The birds appeared to be on the increase throughout April. A female was shot on April 30th but showed no indications of breeding.

LESSER HONEY GUIDE (*Indicator minor nr. teitensis*.).

The species was uncommon. A female was shot at Lodwar on February 13th.

BROWN-THROATED BARBET (*Tricholæma melanocephala stig-matothorax*, Cab.).

A few birds were seen at Lokitaung, where a female was shot on March 14th, and they occurred in small numbers in other parts of Northern Turkana, but were nowhere common. A single bird of this species was seen at Lodwar on April 6th.

NUBIAN RED-HEADED SPOTTED WOODPECKER (*Campothera nubica nubica*, Bodd.).

Fairly common throughout Turkana, especially near permanent water. A pair was observed to be constructing a nest on May 2nd at Lodwar, but this was abandoned before completion.

EAST AFRICAN BLUE-NAPED COLY (*Urocolius macrourus pulcher*, Neum.).

A male and female were obtained from a party of eight on March 25th in North Turkana, and several more were seen in the same district. On the Turkwell, in spite of apparently ideal conditions no birds were seen during the latter half of February nor throughout April. The species was again noted on May 2nd and many were seen, and for the ensuing fortnight they were present in considerable numbers. A further pair was obtained at Lodwar on May 3rd, but no birds were found nesting until September 17th when a bird was found sitting on her nest, but as this was inaccessible it was not examined; it apparently contained eggs.

ROLLER (*Coracias caudatus* ?).

A pair of Long-tailed Rollers was found to be nesting on April 3rd at Lodwar, but the nest was inaccessible and no specimen was obtained although several pairs were seen in the district.



On April 29th seven Rollers were seen passing over Lodwar towards the south-west. None of these were collected owing to the height at which they flew, and the species could not be ascertained with certainty, but it was obvious that they had square tails without the elongated outer feathers.

**JACKSON'S HORNBILL** (*Lophoceros jacksoni*, O. Grant.).

Extremely common throughout Turkana in wooded districts particularly along the Turkwell River. In the Lodwar area, during the first half of May several pairs appeared to be about to begin nesting, but no nesting holes were found.

**WHITE-THROATED BEE-EATER** (*Merops albicollis maior*, Parrot.)

Not very common. The only birds seen were found in one locality on the plains south-east of Mt. Labur, where they were present in fair numbers on March 8th to 10th.

**CRIMSON LONG-TAILED BEE-EATER** (*Merops nubicus nubicus*, Gmel.).

This was very common along the lake shore from the middle of March onwards. They first appeared on March 15th on the east of Labur. At Ferguson Gulf they were found to be plentiful in April passing up and down the grassy margin of the lake. They were often observed to rest on the backs of goats and donkeys. A pair was seen passing over Lodwar in a south-westerly direction on April 30th and again on May 6th. Several were seen flying in the same direction, but none settled. All these birds were flying at a considerable height and were possibly on migration, as these were the only occasions on which the birds were seen inland from the lake.

**BLUE-TAILED RED-BILLED WOOD HOPOE** (*Phoeniculus erythrorhynchus niloticus*, Neum.).

A few birds were seen at Lodwar in February and again in April, but none were observed in any other locality.

**YELLOW-BILLED SCIMITAR-BILLED WOOD HOPOE** (*Rhinopomastus minor cabanisi*, Filipp.).

No birds were seen anywhere in Turkana during the Spring, but in September a few were found at Lodwar, where a specimen was obtained on September 17th. All the birds were very tame and easily approachable. No signs of nesting were observed.

**PLAIN-BACKED NIGHTJAR** (*Caprimulgus inornatus*, Heugl.).

Nightjars were fairly plentiful throughout Turkana, particularly in the neighbourhood of Lodwar. Only one specimen was obtained, but

at least two species were present. Two clutches of eggs were taken on May 9th at the Kabua River, but unfortunately no specimens of the parent bird was obtained in either case. One probably belongs to the species cited and the other, considerably larger, to *C. frenatus*.

#### EUROPEAN SWALLOW (*Hirundo rustica rustica*, Linn.).

Very few Swallows were seen except near the lake, until after the beginning of the rains. On April 28th a flock of several thousand birds appeared over Lodwar at about 5 a.m. where they remained until dark wheeling over the Turkwell River at a considerable height. No specimens were obtained and the following day the birds had gone. It is probable that these birds were on their northward flight. On September 25th, the species was again noted some miles out over the lake, flying southwards.

#### NORTHERN LESSER WHITE-THROATED SHRIKE-FLY-CATCHER (*Bradornis griseus pumilus*, Sharpe.).

Very common throughout Turkana. Seen usually in pairs and never singly. A nest found at Lorogumu on May 15th contained two newly hatched young and one egg. The nest was constructed of twigs forming a deep cup lined with a few feathers and was situated about ten feet from the ground in a small acacia. This nest differed somewhat from that of *B. griseus griseus* which consisted of little more than a light shallow platform of rootlets and unlined; the eggs are, however, alike. The parent birds showed a similar reluctance to leave the nest, remaining until actually touched. No other nests were found.

#### UGANDA BROWN-BARRED PUFF-BACKED FLYCATCHER (*Batis minor nyanzae*, Neum.).

Not very common. The only birds seen were in northern Turkana amongst the hilly country at an altitude of about 5,000 ft. The female obtained was shot on March 21st and showed no indication of breeding.

#### PIGMY PUFF-BACKED FLYCATCHER (*Batis soror perkeo*, Neum.).

Not common. Two pairs were seen together at Lodwar on September 17th when a female was obtained but previously none were observed in Turkana nor were any seen subsequently.

#### PARADISE FLYCATCHER (*Tchitrea ferreti*, Guer.).

Not very common. Seen only in thick bush along the Turkwell after the beginning of the rains. The pair obtained are in the brown phase and had a nest containing three eggs which were laid on May 9th, 10th and 11th. The eggs are white with a very distinct zone of pink-lilac spots round the larger end and closely resemble those of the

European Tree-creeper (*Certhia familiaris*, Ridgw.) though a little bigger. They measure 19 x 14 mm. The nest was situated about six feet from the ground in very thick scrub and was composed of grass fibre lined with hair. Several specimens of the white-backed variety were seen at Lodwar, but these seemed to be rather timid and none were collected.

PALE-BACKED WHITE-HEADED SHRIKE (*Eurocephalus ruepellii ruepellii*, Bp.).

Very common along the Turkwell where two specimens were obtained on April 9th and May 4th, but none were seen elsewhere. The birds soon became fairly tame and would feed all round the camp quite fearlessly. No signs of breeding were observed in May, but on September 10th a nest was found at Lodwar with young birds. This was a very neat structure, built of twigs and fluff suspended in the angle of a horizontal fork, and it was impossible to see whether it contained two or three birds. The parent birds strongly resented any intrusion becoming very noisy and excited, though not actually aggressive as is sometimes the case with the Drongo Shrike. On September 19th another pair was seen feeding four fully fledged young which had already left the nest.

PALE-FLANKED BRUBRU (*Nilaus minor*, Sharpe).

Two males and a female were shot at Lokitaung on March 16th where the birds were found to be quite common. They were generally seen in pairs and were very noisy. No birds were seen further south until May 5th when a single female was obtained on the Turkwell River, near Lodwar. This bird was found to have swollen ovaries and would shortly have laid eggs, but no nest was found. During the next few days several more birds were seen, always feeding in the acacia tops. In September they were again found at Lodwar and some pairs appeared to have nests but none were located.

SOMALI STRIPE-HEADED BUSH SHRIKE (*Harpolestes jamesi jamesi*, Shell.).

Not common. A few single birds were seen in north Turkana but not elsewhere. The birds were very shy and retiring in their habits, and being very inconspicuous are probably more common than appears to be the case. The male obtained was shot near Lokitaung on March 25th.

LARGE GREY-BLACK SHRIKE (*Laniarius funebris funebris*, Hartl.).

Fairly common in the thick bush along the Turkwell River, but seen nowhere else in Turkana. The birds were found generally in pairs but were always shy and inconspicuous. In the early morning and



again towards evening the dual call of the male and female was continually heard, though the birds themselves kept well out of sight. A nest was found on May 10th containing two eggs, and on the next day as no further eggs had been laid the parent bird was collected and proved to be a male. The eggs which were slightly incubated are pale green with light reddish-brown markings uniformly distributed over the whole surface and not forming a zone as is the case with most of the Shrikes. The nest was situated about three feet from the ground in a leafless bush and was entirely exposed to the sun. It was constructed of coarse grass and rootlets fairly firmly woven together and unlined. The eggs measure  $23 \times 16$  mm.

#### WHITE-RUMPED SADDLED-BACK SHRIKE (*Lanius somalicus mauritii*, Neum.).

Common in the open sub-desert country but not seen in the thicker bush or near water. They were found generally in pairs or occasionally singly, but never more than two birds together. Two eggs brought in by natives at Lodwar on May 10th were stated to belong to this species, the Turkana name for which is "Billingerro."

These eggs are creamy-white with a few indistinct greenish-brown spots forming an irregular zone round the large end and showed about three days' incubation. In general appearance they resemble the eggs of certain species of shrikes, but the identification is unsatisfactory.

#### EUROPEAN RED-BACKED SHRIKE (*Lanius collurio*, Linn.).

A male was shot at Ferguson Gulf on April 14th while feeding on beetles near the lake shore. On April 18th a female was obtained among the Dom Palm scrub some two miles from the shore. No other specimens were seen.

#### PALE-WINGED DRONGO SHRIKE (*Dicrurus adsimilis divaricatus*, Licht.).

Very common along the Turkwell where they were nearly always to be found "hawking" among the larger trees. A few birds were also seen at Lokitaung but in the north they were much less numerous.

A female shot at Lodwar on May 6th had one almost fully developed egg which would have been laid within a few hours. Such markings as are visible on the shell are nearly black and sharply defined, thus very similar to a clutch taken at the end of June, 1932, in South Kavirondo. Two birds were seen building on May 11th but no completed nests were found. The birds are always very aggressive, continually fighting with each other and almost any other bird that comes near them.



### BROWN-NECKED RAVEN (*Corvus ruficollis*, Less.).

Very common throughout Turkana, particularly in the neighbourhood of Lodwar and Lokitaung where they became extremely tame.

The specimen obtained was shot on the lake shore east of Mt. Labur on March 2nd. Some birds appeared to be mating at Lokitaung at the end of March, but no nests were found. On April 28th a nest was seen on Central Island containing two eggs. These appeared to be normal eggs, but the nest was situated in an inaccessible part of the cliff and specimens were not obtained.

### RED-BILLED OX-PECKER (*Buphaga erythrorhyncha*, Staud.).

Very common in the populated districts but seldom seen elsewhere, probably due to the scarcity of game animals. The Turkana kill the birds whenever possible, believing that they kill and eat their sheep and goats. This seems to bear out the theory that they feed not only on the ticks which infest the animals but on the wound caused by their extraction. A female brought in by natives on April 7th, at Lodwar, had swollen ovaries and was apparently about to lay, but no nests were located.

### WATTLED STARLING (*Perissornis carunculatus*, Gm.).

Frequently seen near Lodwar and also in North Turkana near fresh water, but none were seen at the lake. The birds were always found in flocks of about thirty and they were never seen to mix with other species of Starlings although many others were found in the locality. No nests were found.

### WHITE-BANDED GLOSSY STARLING (*Spreo superbus*, Rupp.).

Very common throughout Turkana, both in the thick bush and in the more or less open desert country. At Lodwar the birds became very tame, sometimes venturing almost into the tents in search of food. Several pairs appeared to be nesting at the end of April, but no nests were found.

### GREEN GLOSSY STARLING (*Lamprocolius chalybeus*, Ehrenb.).

Common in West Turkana, but not in the vicinity of Lake Rudolf. A nest was found near Kacheliba on May 11th and probably belonged to this species, but unfortunately neither parent was obtained for identification. The nest had apparently weathered several seasons, but was very firmly constructed in a low thorn tree about six feet off the ground. It contained three eggs almost ready to hatch which in colour and size resemble very closely those of the Masai Glossy Starling (*L. c. massaicus*, Neum.). They measure  $29.5 \times 17$  mm.

GREEN-HEADED LONG-TAILED STARLING (*Lamproctornis purpuropterus*, Rupp.).

Fairly common in the wooded country along the Turkwell, but not often seen elsewhere. They were found generally in small numbers with the Spreos and not in flocks by themselves. Towards the end of April a few pairs appeared to be beginning nesting operations, and on May 11th a pair was seen to be re-lining an old disused Woodpecker's nest, but no eggs were found. The female shot at Lodwar on May 11th showed no enlargement of the ovaries.

HELMETED RED-WINGED STARLING (*Galeopsar salvadorii*, Sharpe).

Common in all suitable localities, particularly in the rocky gorges in north Turkana. Some birds appeared to be nesting towards the end of March, but all the supposed nesting sites were inaccessible and no eggs were obtained.

WHITE-HEADED GIANT WEAVER (*Dinemellia dinemelli*, Rupp.).

Common throughout Turkana. Two or three birds were generally found together, but seldom more. They occurred only in the very dry thorn-bush country and were never seen in the more wooded districts.

BLACK-CROWNED SPARROW WEAVER (*Plocepasser mahali melanorhynchus*, Rupp.).

Very common in certain localities in north Turkana but not seen in the Lodwar area. A large colony was found on March 10th and after light rains several pairs appeared to begin nesting. The majority of nests seen, however, were roosting nests, open at both ends, and none of the breeding nests examined contained eggs. The species was also common at Kacheliba, where on May 17th a female was shot off a nest which contained two eggs. Several other nests were examined at the same time but none of these contained more than one egg. It was noted at this colony that each nest with eggs was situated immediately below a roosting nest, and all were in low thorn trees. The two eggs obtained were half incubated and have a pale-pink ground with dark red and brown markings. They are rather elongate and both in colour and shape somewhat resemble those of the Gross-beak Weaver *Amblyospiza albifrons montana*, van Som. They measure  $24.75 \times 16$  mm.

BLACK-CHEEKED RED-HEADED WEAVER (*Anaplectes melanotus*, Lafre.).

Apparently rather scarce in Turkana. A few birds were seen in the northern part of the district in March, but none were seen elsewhere. Only one specimen was shot; its stomach contained little else than ants and beetles.

LESSER BLACK-FACED WEAVER (*Hyphantornis intermedius intermedius*, Rupp.).

This species was not observed in Turkana in April and May, but in September they were present in considerable numbers. The three specimens obtained were shot from a large flock on September 17th. The birds were found to inhabit the tall acacias along the banks of the Turkwell River. No nests were located.

LITTLE MASKED WEAVER (*Hyphantornis vitellinus uluensis*, Neum.).

No birds were seen after the beginning of the rains, the first to be noted was at Lodwar on May 5th. On the 7th they were found to be present in large numbers, mainly in flocks, while a few were observed to be building. At Lorogumu a small colony of six nests was found on May 15th in a large thorn tree. All the nests appeared to be occupied, but only one was accessible; this contained four fresh eggs of a greenish colour closely speckled with chestnut brown. Measurements: 20 × 14 mm. The nest was composed of coarse grass and unlined. One egg was found to be firmly embedded in the grass, possibly laid before the inner lining of the nest was completed, and so becoming covered.

LARGE PALE FIRE-THROATED FINCH (*Pytelia sudanensis*, Sharpe).

Fairly common in the thick bush along the Turkwell River but very shy and seldom seen. The birds increased in numbers at the beginning of the rains but no signs of nesting were seen. The birds obtained were taken at Lodwar at the end of April and the beginning of May.

UGANDA GREY SPARROW (*Passer griseus ugandæ*, Reichw.).

Very common at Lokitaung where they occurred in large flocks, but few birds were seen elsewhere. It was noted that they made use of old nests as roosting places, sometimes several birds being found together in one nest. No eggs were found.

LARGE GREY SPARROW (*Passer gongonensis*  $\geq$  *P. abyssinicus*).

Fairly common along the Turkwell River, but not seen elsewhere. The birds were found to be more shy than is the case with most Sparrows, and did not readily become accustomed to human beings.

A nest was found at Lorogumu on May 15th and probably belonged to this species though unfortunately no parent bird was shot.

The two eggs are rather larger than those of *P. g. ugandæ* and darker in colour. The nest was constructed of sticks lined with grass and a few feathers and had a tubular entrance; it appeared to have



been built some seasons previously and may have been, in the first instance, that of a starling or some other species.

**MASAI YELLOW-THROATED SPARROW** (*Petronia pyrgita massaica*, Neum.).

This species was not noted until September, when they were found to be plentiful round Lodwar. They frequented the tall acacias along the Turkwell, being found feeding in flocks amongst the Black-faced Weavers *H. i. intermedius*.

**MOTTLED-BACK YELLOW-BREASTED BUNTING** (*Emberiza poliopleura*, Salvad.).

Fairly common throughout the Turkana but nowhere seen in large numbers. The birds were generally seen in the open thorn scrub, where during the greater part of the day they were to be found on the ground or perched on the lower twigs of the bushes, as they sheltered from the heat of the sun. No nests were found. The specimens obtained were from the northern part of the district.

**CINNAMON-HEADED FINCH LARK** (*Eremopteryx signata*, Oust.).

Very common in flocks varying from twenty to fifty or more individuals, particularly in the dry country a few miles from the lake shore. The birds were never seen in pairs and did not show any signs of nesting. The three males obtained appear to be rather paler than typical *E. signata* in the markings of the head; the females also require to be compared with typical material as there is a possibility that the Turkana birds represent a geographical race. No birds were seen in September or October.

**PINK-BREASTED SINGING LARK** (*Mirafra poecilosterna poecilosterna*, Reichw.).

Not common. The specimen obtained was the only one noted in Turkana. The bird was taken at Lokitaung in March where it was found perched on a tree, and although observed for some little time was not seen to settle on the ground.

**CRESTED LARK** (*Galerida cristata somalensis*, Bianch.).

Not very common. The male obtained was procured at the north end of Lake Rudolf near the shore, where they were seen in fair numbers. A few more were observed at Ferguson Gulf, in April. They were not seen inland.

**LONG-BILLED MOTTLED PIPIT** (*Anthus sordidus longirostris*, Neum.).

A common species in the high country in Northern Turkana, but seldom seen in the low plains or near the lake. The birds were



noted singly, or occasionally in pairs though no signs of nesting were seen. It was noted that they were nearly always to be seen perching in trees, and not on the ground.

**GREY-HEADED WAGTAIL** (*Motacilla flava thunbergi*, Billberg).

Very common along the lake shore where they occur in large flocks, but seldom far from water. On March 24th a flock of about forty appeared at a waterhole near Lokitaung and remained feeding in the neighbourhood for about four hours. No others were seen in the district, and it is possible that these birds were passing on migration. With this exception the birds were only seen at the lake shore. Many of the birds were in full plumage.

**SOMALI BROWN SCRUB BULBUL** (*Phyllastrephus strepitans pauper*, Sharpe).

This species was common along the Turkwell, frequenting the thick scrub. The birds were found generally in pairs but gave no indication of nesting. Although somewhat retiring in their habits, they are at the same time very inquisitive of any unusual sight or sound, often approaching to within a few feet of any intruder. They will however very rarely venture into the open.

**UGANDA YELLOW-VENTED BULBUL** (*Pycnonotus tricolor minor*, Heugl.).

A common species throughout Turkana, particularly round Lodwar and Lokitaung. A pair was seen building on May 5th near Lodwar, and an egg was laid on May 7th. The nest was situated on the lowest leaf of a Dom Palm, and had no base, but consisted of a ring of grass fibre and hair to keep the eggs in place on the palm leaf.

Before the second egg was laid, a heavy shower of rain washed the nest and egg on to the ground. No other nest was found though several pairs were breeding.

**RED AND YELLOW-BREASTED SUNBIRD** (*Nectarinia pulchella lucidipectus*, Hart.).

Though not encountered elsewhere, this species was common at Lodwar after the beginning of the rains. A nest was found on May 9th which was inaccessible but as the female was sitting, it probably contained eggs. Another nest was found on September 17th which contained two nearly fledged young. When the female fed the young she was quite fearless and could be observed at a distance of a few feet.

ABYSSINIAN BLACK-BELLIED SUNBIRD (*Cinnyris mariquensis*  
*osiris*, Fins).

A female obtained at the south-east of Mt. Labur was the only specimen seen.

GREEN-RUMPED PURPLE SUNBIRD (*Anthreptes orientalis*,  
Hartl.).

This species was common throughout Turkana. but females were more often seen than males. A female shot on May 9th had swollen ovaries and was apparently about to lay, and on May 15th another was obtained from a nest containing two eggs. These are greenish-grey closely speckled with dark brown and black. The nest was situated about four feet from the ground in a low thorn bush and was constructed of fine grass and fluff felted together. The eggs measure 17.5 x 12 mm.

KENYA WHITE-BREASTED PENDULINE TIT (*Anthoscopus*  
*musculus* sub. sp.).

This was not a common species. The single specimen obtained near Lodwar on February 17th was the only bird seen.

KENYA WHITE-CHEEKED TIT (*Parus thruppi fricki*, Mearns).

Not common. A female was shot at Lokitaung on March 13th but no others were seen.

PALE WREN WARBLER (*Prinia somalica intermedia*  $\gtrsim$  *erlangeri*?)

One male and a female were obtained. Several birds were seen in the hilly country of north Turkana, but on the whole they are not common. The birds were only seen singly, and were generally found feeding in the tops of tall acacias, where they were very inconspicuous.

UGANDA RUFOUS-FACED WARBLER (*Dryodromas rufifrons*  
*turkana*, van Som.).

A common species in the hilly country of north Turkana and not noted elsewhere. The birds were found to occur mainly in the low thorn scrub and the rocky outcrops. In the field, the relatively dark tail is a very conspicuous feature. This is held erect and continually waved from side to side, so that the bird somewhat resembles the European Wren. The birds were always found in pairs and seemed to be entirely fearless, paying no attention to any disturbing element unless a shot were fired, and then only moving off to a short distance to continue feeding. The search for food is very systematic, beginning either at the top of a bush and working gradually down to the ground or *vice versa*.

Both birds would work the same bush, and it was noted that one bird always finished first and passed on to the next bush, followed immediately by the second bird, which did not wait to complete the bush it was already working. The four specimens shot were obtained on March 19th and 20th. No signs of nesting were observed.

**NORTHERN LITTLE YELLOW-BELLIED SCRUB WARBLER**  
(*Eremomela flaviventris griseoflava*, Heugl.).

Not very common. A few birds were seen near Lodwar in February and a female was obtained on the 15th. A single male was taken at Lokitaung on March 15th. No other specimens were seen.

**WHITE-BELLIED CROMBEC** (*Sylvietta brachyura leucopsis?*)

Fairly well distributed throughout Turkana, but nowhere occurring in very large numbers. Frequently seen at Lodwar feeding on the acacia tops, generally in pairs. Males and females obtained on the Turkwell River showed no signs of nesting.

**TURKANA GREEN-WINGED WARBLER** (*Camaroptera brevicaudata* nr. *abyssinnica*).

This species was not common. Found only in thick bush along the Turkwell near Lodwar. Like the Scrub Bulbuls they were found to be rather inquisitive, but none were ever seen to emerge from cover.

**AFRICAN REED WARBLER** (*Acrocephalus beaticus*, Vieill.).

A female shot on April 9th was the only specimen seen. It was found in the thick bush of the Turkwell River, and was difficult to approach.

**WILLOW WREN** (*Phylloscopus trochilis trochilis*, Linn.).

Not very common. Two females obtained on March 16th at Lokitaung were found feeding together in the acacia trees and were fairly tame. A female was taken at Ferguson Gulf on April 18th where it was observed amongst the grass tufts, near the lake shore. This bird was extremely timid and kept at a safe distance but eventually became entangled in some Dom Palm fibres. Two more birds were seen at Lodwar on May 3rd but were not obtained.

**NORTHERN RUFOUS SCRUB CHATTERER** (*Argya rubiginosa* rubiginosa, Rupp.).

Fairly common along the Turkwell, but not seen in any other locality. The birds seemed to confine themselves almost entirely to



the Dom Palm scrub, retiring to the thickest clumps when disturbed and never venturing more than a few yards into the open.

They were seldom seen in pairs, but generally three to five birds would be found together. A female shot on May 2nd had very much enlarged ovaries, and was within about two days of laying.

This bird was one of five engaged in courtship pursuit and exhibiting great excitement. No nests were found.

#### RUDOLF SPECKLED BABBLER (*Cichladusa guttata*, Heugl.).

A few birds were seen at Lodwar but not elsewhere. The birds were observed mainly in the Dom Palm scrub and occasionally in thick thorn scrub, but they were always extremely shy and difficult to approach. None were seen before the rains, the first bird being taken on May 3rd. The two females obtained showed no enlargement of the ovaries.

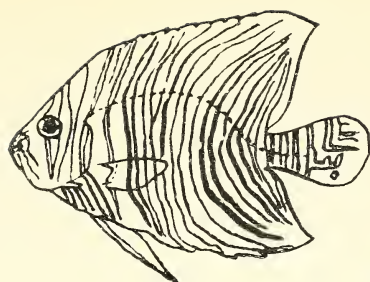
#### NORTHERN GREY-STREAKED SCRUB CHAT (*Erythropygia leucoptera* Sub. sp.)

The birds obtained agree very closely with three birds also from west Rudolf in Dr. van Someren's collection. They are intermediate between *E. leucoptera leucoptera* and *E. l. vulpina* both in the extent of the rufous area of the mantle and the grey of the crown.

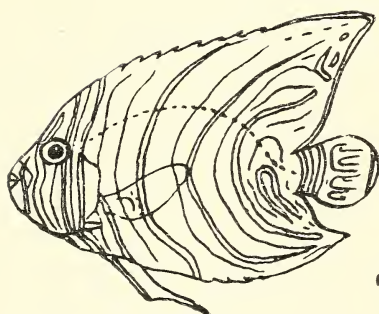
The birds were found in fair numbers throughout Turkana, frequenting the open thorn scrub often far from water. They were observed to keep near the ground and were on the whole rather shy and retiring. When disturbed they fly only a short distance, and on settling raise and spread the tail, thus exposing the marked black and white tips of the tail feathers. This feature gives the bird something of the appearance of a *Cisticola*, when seen at a distance.

A female obtained at Lodwar on May 4th was found to have two ova nearly ready for laying. At Lorugumu a nest was found on May 15th containing two eggs and also an egg of the Solitary Cuckoo, *Cuculus solitarius*. The nest, consisting of a deep cup composed of grass and lined with hair, was well concealed, situated about a foot from the ground amongst branching stems of a small bush, enclosed by nettles. The two eggs which showed about four days incubation are pale greenish-cream fairly closely speckled with pink and brown, the markings being somewhat concentrated toward the larger end. They measure  $19 \times 15$  mm. The Cuckoo's egg is much larger, measuring  $24 \times 20$  mm. and is bright blue, similar to the eggs of the Glossy Starlings.

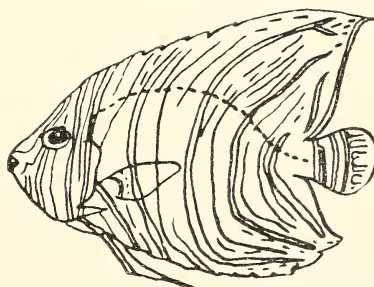




№ 1



№ 2.



№ 3



*Holacanthus semicirculatus.*

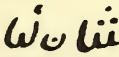
## HOLACANTHUS SEMICIRCULATUS (Cuv.)

By

H. COPLEY.

There has been added to the fish collection of the Museum a specimen of this fish, one of which caused such a sensation a few months ago in Mombasa.

This fish belongs to the large family of carnivorous tropical reef fishes, the *Chaetodontidae*, and the Genus *Holacanthus*. Generally the whole family have gaudy and beautiful colour patterns on a body ovoid or subrhomboid in shape with often sharp dorsal fin rays. Day, "The Fishes of India" gives it the name *Holacanthus Nicobariensis* var. *semicirculatus* and Playfair, "The Fishes of Zanzibar" calls it *Holacanthus Alernans*. It is found from Mozambique to Aden, the whole of the East Indies, Melanesia and Polynesia and is a common fish. The general body colour is a rich blackish brown or chocolate with whitish lines that can easily be seen in the photograph. Plate I. The border of the soft vertical fins have narrow blue lines, also the ventral has the front edge bordered with blue and several blue lines. The pectoral fin is brownish and the caudal has two, three or four white bars near the caudal peduncle while the posterior portion has a number of broken lines and dots. It is these broken lines and dots which make the fish so interesting. The number and position of these white line markings is very variable and three examples are shown in the line drawings which are taken from Fowler," "Fishes of the Philippine and adjacent Seas." Sometimes the lines and dots on the caudal form the

Arabic  (Sham-a-la; the Work of Good or Shanu Allah, the Miracle of God.) Then the fish causes great excitement and the particular specimen is carefully preserved in the Mosque for the Faithful to come and marvel at. This was the case of the Mombasa fish for the sacred writing was found on its tail. The specimen deposited in the Museum has not the sacred characters, so is a very common specimen. There is a specimen in Cairo, one I remember being caught at Port Sudan and going to Medina, one in Zanzibar and the one in Mombasa all with the same inscription on its tail. There may be more but those are personally known to me but the more one thinks of it the more extraordinary it is that a number should be obtained to be a marvel to the Faithful and an enigma to the learned.



## BOTANICAL NOTES.

By E. R. NAPIER.

### RANUNCULACEAE (Cont.)

“ Traveller's Joy,” “ Old man's beard.”

*Clematis*.—A cosmopolitan genus described by Linnaeus, containing many beautiful cultivated species, and a few medicinal ones. Of the 200 species distributed over the world, 40 occur in Africa. but only about a dozen are to be found in the Tropics. Three of those might be called common in Kenya.

#### PLATE I.

*Clematis grata*, Wall.—A rampant climber covering entire bushes with its shroud of greenish white flowers, which later turn to feathery fruits—the “ old man's beard?”

STEMS.—Somewhat woody, ribbed, twining, covered with very short dense hairs.

LEAVES.—Dark green, scarcely hairy above, but with silky hairs below, 3, 5. or 7 leaflets, which are stalked, ovate, broadly and irregularly toothed, or sometimes with three distinct lobes. They are in opposite pairs.

FLOWERS.—In leafy panicles, or without leaves. Flower stems thickly covered with short hairs. Flowers greenish white about  $\frac{3}{4}$ " in diameter. Sepals usually four, spreading or reflexed, silky hairs outside but nearly smooth and hairless inside. No petals; a thick ring of yellow tipped stamens surrounds the bunch of pappus-like styles. As the seed ripens these styles become more hairy and longer, finally about 2 inches long, with dark tips, the seed is then distributed by wind.

DISTRIBUTION.—Common around Nairobi, and in other parts of the Colony, also found in Abyssinia, Angola, Zambesi and in Asia.

*Clematis inciso-dentata*, A-Rich.—Perhaps this is the commonest of the Kenya species, it occurs from about 6,000 feet, upwards to about 8,000 feet, and is very conspicuous along the Lumbwa-Kericho roadside.

The leaves vary greatly but are usually smaller and rounder than those of *C. grata*, the nerves being depressed on the upper and very prominent on the lower surface.

The flowers are about 1" in diameter, creamy white in colour.

*Clematis Simensis*, Fresen, easily distinguished from the above species by the narrow shiny glabrous leaves, leaflets are longer and narrower, stems usually dark red, flowers greenish white.

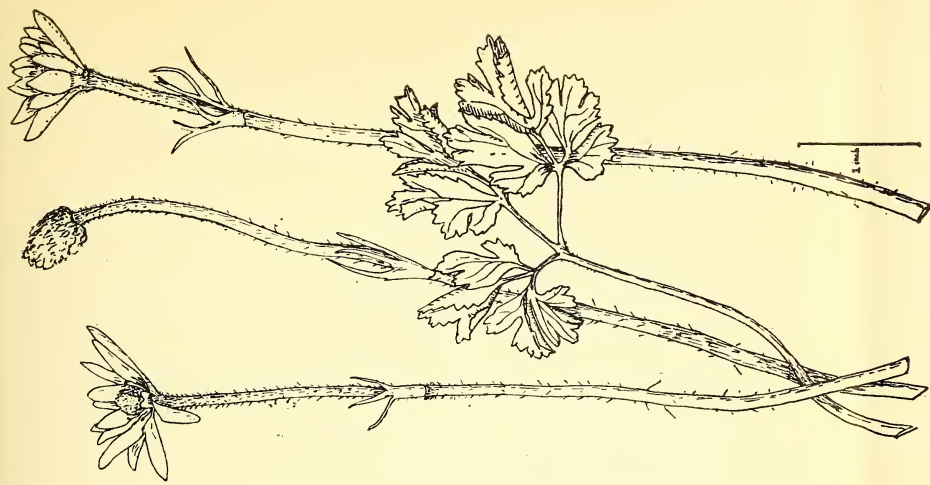
The following species were found by the Fries brothers in 1930.

*C. Friesiorum*, Ulbrich, Meru district.





*Clematis grata*, Wall.



*Anemone thomsonii*, Oliv.





PLATE II.



*Thalictrum rhynchocarpum*, Dill et Rich.



*Berberis holstii*, Engl.



*C. Whightiana*, Wall. on Mount Kenya and the Aberdares.

*C. Stolzii*, Eng., Meru forest, also Nyassaland.

*Anemone*.—About 120 cosmopolitan species, of which “ 15 species come from North, South, and East Africa, several are poisonous, some are used as ornamental or medicinal plants.” (Thonner’s Flowering Plants of Africa). The genus was described by Linnaeus.

#### PLATE I.

*Anemone Thomsonii*, Oliv. described in 1883, inhabits the mountainous country, growing in moorlands, usually near streams. Ulbrich describes a variety of this species from the Aberdares, but it is very much like the original *A. Thomsonii*.

STEMS.—Erect, rather thick and hairy, the hairs are thicker and longer near the flower head than on the lower part of the stem. Height varies from a few inches to just over a foot. The stem bears a few sessile leaflets below the flower head.

LEAVES.—Radical, on stems varying from a few inches to a foot, compound with three stalked main divisions each consisting of three divided and toothed leaflets, hairy or nearly glabrous.

FLOWERS.—At the apex of unbranched stems, about  $1\frac{1}{2}$ ” diameter. The outer perianth segments purple, the inner ones cream, but colours vary slightly.

The numerous stamens of different lengths form a thick circle around the tightly packed knob of achenes, which are clothed in whitish down, the stigmas protrude and are of a darker colour.

DISTRIBUTION.—Kilimanjaro; Elgon, Aberdares, Mount Kenya. This includes the variety *A. Thomsonii* var *Friesiorum* Ulbrich. There are no other species recorded from Kenya.

*Thalictrum*.—Ather of the numerous genera first described by Linnaeus, it is really a N. Temperate genus. It is however represented in the tropics by one species.

#### PLATE II.

*Thalictrum rhynchocarpum*, Dill et Rich.—The plant when not in flower bears a strong superficial resemblance to a maiden hair fern, not only in form but in its choice of habitat, growing in shade and on river banks.

STEMS.—Main stems reddish green, erect smooth, 2—10 feet high, much branched.

LEAVES.—Compound, curiously branched, leaflets about  $\frac{1}{3}$ ” long, ovate, and toothed. Delicate colour and texture, leaf stems dark red or reddish green.

FLOWERS.—In a diffuse panicle, numerous green flowers on hair like pedicels, which grow after flowering up to 6 inches in length. There is one, and occasionally two achenes (the other members of the family having several to many), it is dark green, brown or black and strongly 3 ribbed on each side, and tapering at both ends, not unlike a large carroway seed.

DISTRIBUTION.—Cosmopolitan.

### BERBERIDACEAE.

*Berberidaceae* belongs to the group or order of *Berberidales*, which consists of five families, but only two are represented in Kenya. The *Berberidales* are more advanced than the *Ranales* in Mr. Hutchinson's opinion. the flowers being hermaphrodite or unisexual the stamens instead of being numerous are fewer and definite in number.

The family *Berberidaceae* is common in cold or temperate countries; in the tropics it is found at an altitude of about 8,000 ft. to 10,000 ft. The chief characteristics are; the petals and sepals are similar, but in two to several series, the stamens are opposite the petals and open either by longitudinal slits or more commonly by valves (as illustrated). There is only one carpel.

---

*Berberis*.—The only East African genus of the three African genera, the other two occur in North and West Africa, none are to be found in South Africa. The genus consists of four species of woody shrubs, with undivided leathery leaves. "They yield timber, tanning, and dyeing materials, fish poison, medicaments, and edible fruits which are also used for the preparation of drinks and confectionery." (Thonner's "Flowering Plants of Africa.")

### PLATE II.

*Berberis Holstii*, Engl.—A bush growing to 12 ft. or more in height, much branched.

STEM.—Woody, dark brown, ribbed, branches somewhat drooping.

LEAVES.—Oblong, narrowing towards the base (cuneate), with spines on the margins, or entire. First leaves of the shoots reduced to spines.

FLOWERS.—In racemes, yellow, consisting of three or four small pink tinged bracts, and nine yellow corolla segments, stamens 6, opening by valves. Ovary superior, green, conspicuous; stigma, flat and round, persistent in fruit. Fruit, a blue-black berry covered with a bloom when ripe.



*Ceratophyllum demersum*, L.



*Nymphaea capensis*, Thunb.





DISTRIBUTION.—Recorded from Mau, Aberdares, and Mt. Kenya at 9,000—10,000 ft. Kinangop at 8,000 ft. and grows in cultivation at 5,700 ft.

Said to be a host of one of the wheat rusts.

### CERATOPHYLLACEAE.

A family of submerged, or partly submerged water plants, consisting of only one genus *Ceratophyllum* which is widely distributed. It is pollinated below the surface of the water, the pollen according to Willis. being of the same specific gravity as water, drifts about until it reaches a stigma.

#### PLATE III.

*Ceratophyllum demersum* L., Hornwort; a glabrous perennial herb, which floats or is completely submerged, it varies considerably in length from a few inches to several feet.

STEMS.—Weak, branched.

LEAVES.—In whorls at close intervals on nearly the whole length of the stems. Twelve or fewer leaves in each whorl, divided, and either linear or with minute recurved thorns at intervals.

FLOWERS.—Solitary in the whorls, male and female in different whorls. Calyx segments green, small, oblong, fruit "broadly ellipsoid, strongly warted and crowned with a long slender beak, about 5 m.m. long, without the beak." (Fl. of W. Trop. Afr.)

DISTRIBUTION.—Cosmopolitan.

### NYMPHACEAE.

This family ends the order or cohort of *Ranales* in Mr. Hutchinson's classification. It consists of water plants growing from submerged rhizomes with large floating undivided leaves, and showy and sometimes sweet scented flowers.

#### WATER LILY.

*Nymphaea* L.—The only East African genus of the family. "There are 20 species in Africa, some used as ornamental and fodder plants; the root stocks and seeds are edible and yield a drink, medicaments and a dye." (Thonner's Flowering Plants of Africa).

#### PLATE III.

*Nymphaea capensis* Thunb.—Described in 1800. *N. caerulea*, and *N. zanzibarensis* are synonyms. It is a very variable species as regards size and colour.

**STEM.**—Shiny, hairless, varying in length according to the depth of the water. Unbranched.

**LEAVES.**—Oval or nearly round, split up to the centre. Hairless nerves showing on the under side, but not as numerous as in *N. Lotus*, often reddish in colour. Margins either irregularly toothed or entire.

**FLOWERS.**—Colour from blue to pink including the intermediate shades of mauve. Sepals narrow compared with *N. Lotus*. Petals numerous, stamens numerous, stigmatic rays short. Size varies from 1 inch to 10 inches in diam. Sometimes sweet scented.

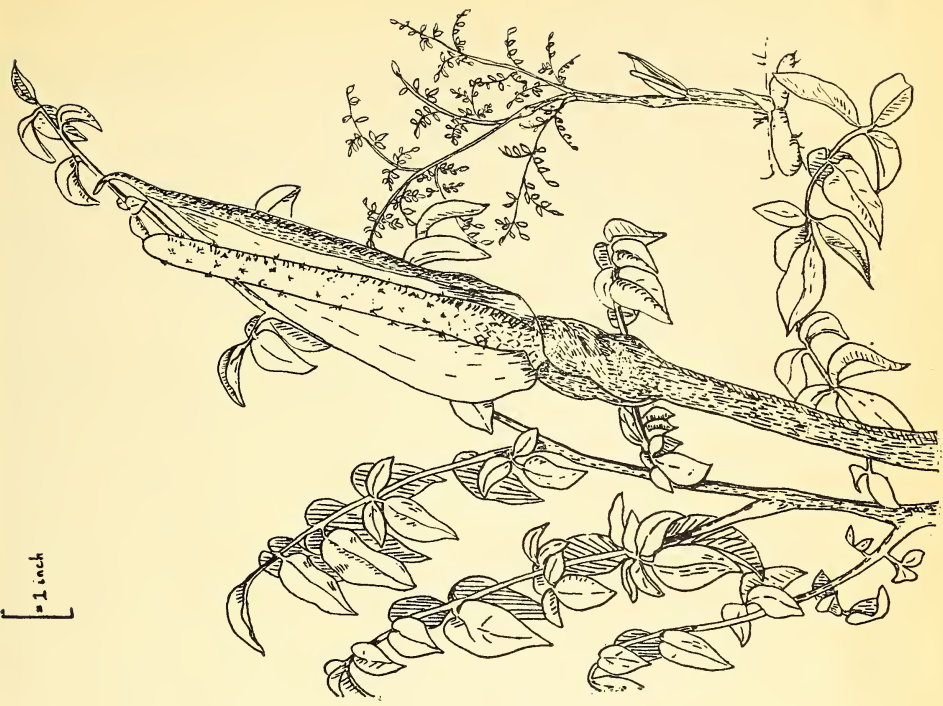
**DISTRIBUTION.**—Egypt, through East Africa to the Eastern Cape, Angola and in Madagascar.

*Nymphaea Lotus L.*—This differs from *N. capensis* in colour of flower which is white or pinkish or blueish white, the sepals are broader. The leaves, are regularly and sharply toothed, with numerous nerves on the hairy under surface. The distribution of this species is from Egypt through East Africa, to Nyassaland and across to Angola, also in Madagascar.

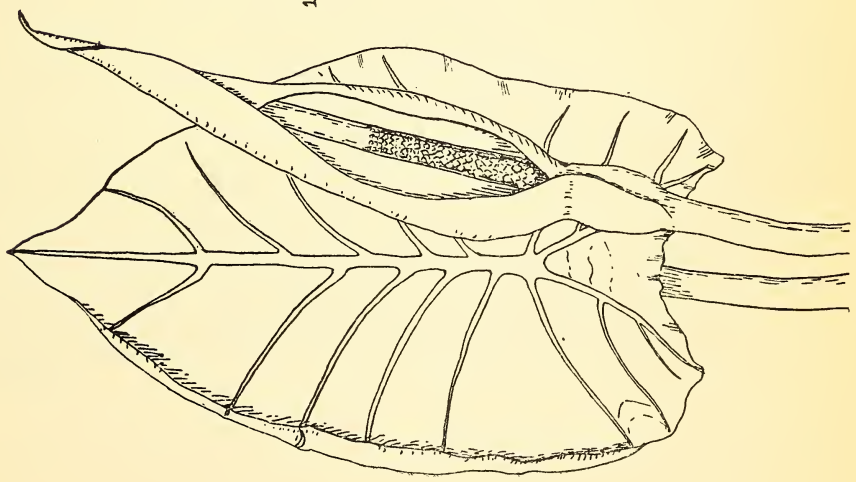
Plate IV should face page 224 of the journal No. 49—50. On page 221 Agricultural Show should be Horticultural Show. On page 223 *Gonatopus Bovinii* should be *G. Bovinii*

PLATE IV.

[ = 1 inch ]



[ 1 1/2 = ]







Hope Dept.  
University Museum,  
Oxford,  
November 5th, 1934.

To the Editor, "*Journal of the East Africa and Uganda Natural History Society*,"

Sir,—I venture to ask readers of the *Journal* to pay particular attention to the question of birds attacking or eating butterflies. The importance of this question will be more readily understood if I approach it from the end instead of the beginning. The Darwin-Wallace principle of Natural Selection is undergoing considerable criticism; it is generally admitted that it is only one of many factors which aid evolution, but some critics, who uphold the Lamarckian doctrine of the direct action of environment, go much further and deny that it has any real importance for evolution. Since the interpretation of the phenomena of protective coloration and "Mimicry" depends upon Natural Selection the critics vigorously attack the current theory of Mimicry; for no one has yet put forward any other explanation of all the known facts. It is generally admitted, by friends and foes, that in the case of mimetic *butterflies* the enemies which are presumed to exercise selective action must be birds. Therefore these critics seize upon the comparative scarcity of records of attacks upon butterflies (though these are far more numerous than they realize) to support the argument that there is no case for natural selection here any more than elsewhere: this argument, however, only deals with mimicry among *butterflies* and ignores the myriad other examples among other insects which inconvenience the critics because they cannot be put aside by the argument used for butterflies!

At Oxford, where E. B. Poulton, the late Hope Professor, first began to accumulate evidence and urge the importance of observation on this matter, there is a large collection of butterflies from all parts of the world which show direct evidence of birds' attacks by the presence on one or more wings of an A-shaped imprint on both surfaces corresponding to the shape of a bird's beak. In some cases I have found it possible to identify the species of bird which made the attack by comparing the mark on the wing with an imprint of the bill on paper, a method suggested by Mr. C. L. Collenette of the Natural History Museum. Secondly, the bird may bite out a A piece from one wing or both wings symmetrically if they have been seized when brought together, or thirdly, it may shear off a portion of a wing by a clean cut. I appeal to collectors to examine carefully the butterflies they capture for such evidence and, instead of discarding them as "bad specimens," to post them to me in the usual triangular paper envelopes so that they may be treasured in the University Museum and add to the evidence that is always open to inspection.

Further, I should be most grateful for records of observations of the attacks of birds upon butterflies, with data, as full as possible, of time, place, and type of bird and butterfly. Some naturalists think that such occurrences are so commonplace as not to be worth recording, but it is the paucity of records that provides critics with their argument. A word of warning may be given. Butterflies fully alert and on the wing are difficult for birds to capture: attacks should be looked for (a) when butterflies are settled on flower heads, on mud, or at rest among herbage or (b) when flying *slowly* around flowers or seeking a resting place during inclement weather, or seeking the proper food plant for the larvae. In large forests such attacks probably occur high up in the canopy where they cannot be seen: hence the attacks most often witnessed are in more open bush country and are more often under heading (a).

All observations or specimens bearing on this important question will aid in the establishment of the truth of what is at present the only possible explanation of mimicry and other forms of protective resemblance in insects.

G. D. HALE, CARPENTER, D.M.

Hope Professor of Zoology (Entomology) in the University of Oxford.  
(Late Specialist Officer for Sleeping Sickness, Uganda).

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OF THE

## EAST AFRICA AND UGANDA NATURAL HISTORY SOCIETY

*April-July, 1934.*

*Vol. XII*

*Nos. 3 and 4*

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EDITOR:

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*Vol. XII.*

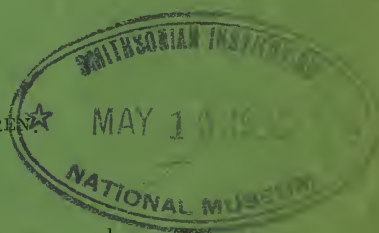
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*Vol. XII*

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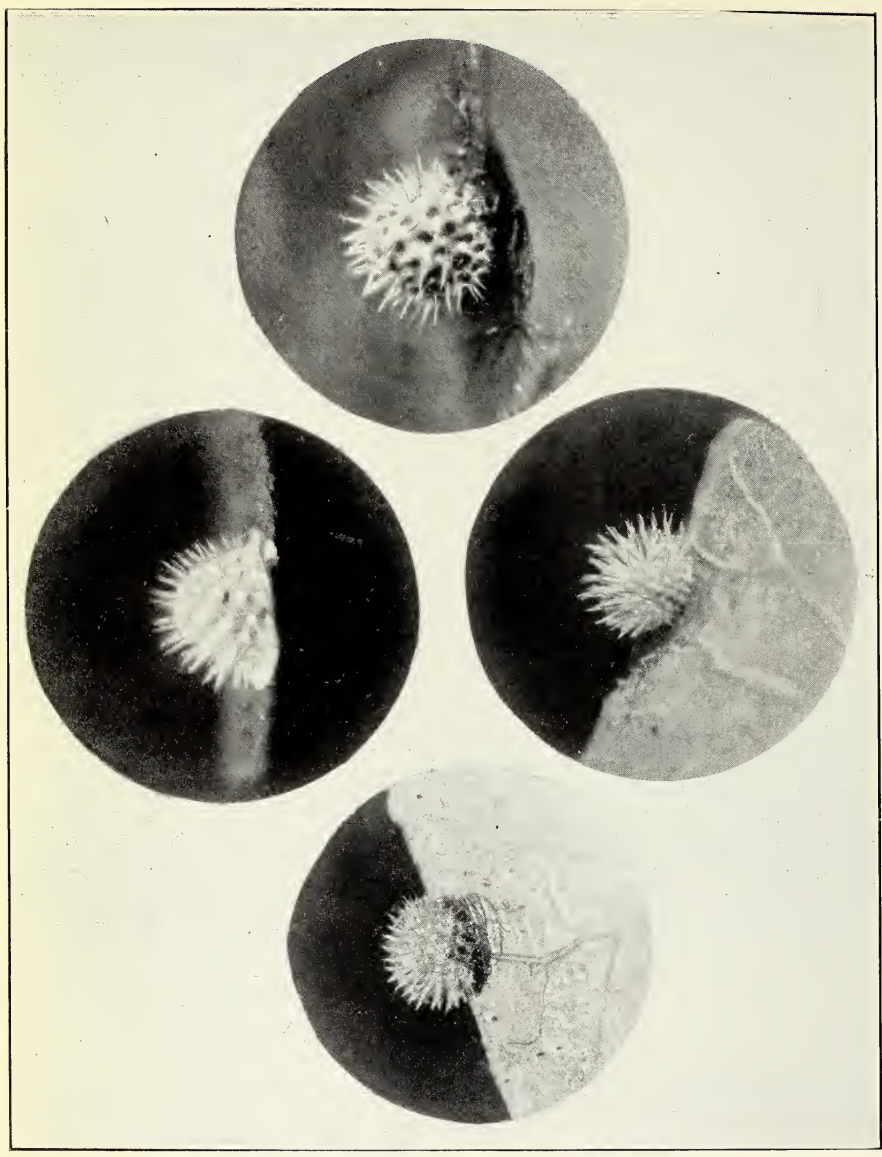
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1

2

3

4

Eggs of Euphaedras.  
1 = *E. medon fraudata*.  
2 = *E. neophron littoralis*.  
3 = *E. spatiosa*.  
4 = *E. uganda*.





PLATE B.

Fig. 1.



Fig. 3.



Fig. 2.

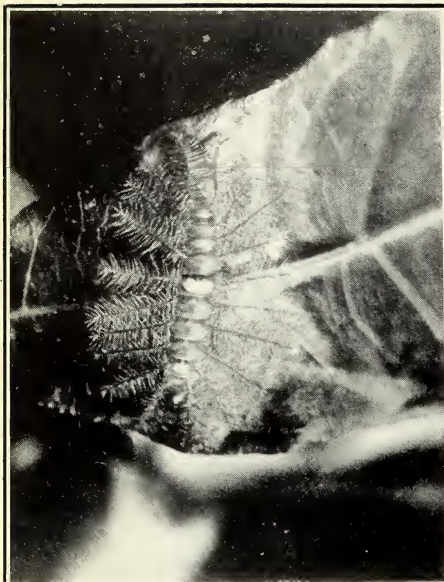
Larvae and pupae of Euphaedras.

Fig. 1=*E. medon fraudata*.

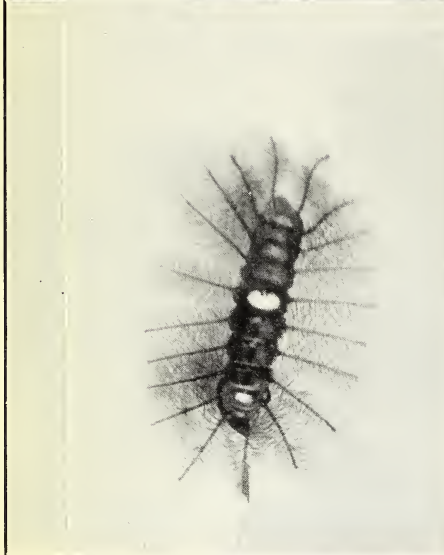
Fig. 2=*E. uganda*.

Fig. 3=*E. spatiosa*.





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Larvae and pupae of Euphaedras.  
Figs. 1 and 2, *E. neophron littoralis*.  
Figs. 3 and 4, *E. neophron meruensis*.



# THE BUTTERFLIES OF KENYA AND UGANDA.

## Part I. Vol. II.

Family: NYMPHALIDAE.

Sub-family: NYMPHALINAE.

GENUS: *EUPHAEDRA*.

### INTRODUCTION.

The members of this Genus are West African for the most part, but some few species range into Uganda and the adjacent parts of Kenya, and two species at least are peculiar to the East African Territories.

They are, for the most part, large-sized butterflies with rather heavy bodies and broad wings, conspicuously coloured in shades of green, blue, purple and brown, and black. Their colours nevertheless harmonise with their surroundings to a remarkable degree. The sexes are very alike in colour, but the females are generally larger.

In practically all the species, a varying degree of variation is found, more particularly in the females, and in some at least, there is evidence of a development towards a mimetic colouration and pattern, influenced by certain common distasteful models within their distribution. Moreover, some of the species are in themselves distasteful and we find a degree of similarity *inter se* which lends protection to the association. Some of these species are themselves models to other species of other genera (Cf. *Ch. tiridates*, *Ch. numenes*, *Ch. bipunctatus*, and *cedreatis* form of *Ch. etheocles*. All in the female sex).

All the *Euphaedras* are forest insects, spending the greater part of the day in deep shade, not so much amongst dense vegetation as in open undergrowth overshadowed by larger trees, which yet allow rays of sunlight to penetrate to the ground. For although shade-loving, these insects are addicted to sun-bathing, when unmolested, but as soon as they are disturbed they seek the shelter of the shadows.

All members of this genus have characteristic larvae: green above and paler green to whitish below, with sometimes conspicuous dorsal markings, and on the latero-dorsal aspect of each segment a long spine adorned with lateral branched spines and feathering which lie flat and spread out on either side of the body so as to touch each other, and the surface on which the larva is resting. The whole aspect is fern-like and feathery. The pupa is characteristic also, being somewhat slender for its size, angular, and ornamented with metallic tubercles. The empty case is thin and glass-like.

Very similar pupae and larvae are found in the near genus *EURYPHENE*, which will be dealt with later.

Much remains to be learnt regarding the early stages of several species of the genus, and it is only by breeding on a large scale that we shall be able to determine the degree of variation in a given species, and the relationship between the so-called species.

*EUPHAEDRA NEOPHRON LITTORALIS*, Talbot.

Pl. I, figs. 1 and 4, ♂.

Pl. II, figs. 1 and 2, ♀.

Talbot. *Trans. Ent. Soc.*, 1929, p. 486.

Expanse: Male 53-65 mm. Female 75-90 mm. General colour violet with black apex to fore-wing crossed by orange bar. Sexes almost alike. Palps orange.

MALE:

F.-w.: basal half bluish-violet, distal half black, slightly more smoky towards the hind angle; tip of wing orange-tawny and extending in below the dark costa; black distal portion of wing crossed by an orange bar 6-8 mm. wide extending from the costa to a point above the hind angle where it curves and narrows into the smoky angle. One or two black spots are present toward the mid-point of the cell.

H.-w.: Bluish-violet becoming smoky at the margin.

UNDERSIDE:

F.-w.: Ground colour ochreous, with a light tawny-brown basal patch and two irregular diffuse brownish bars crossing the disco-cellular region; a diffuse whitish sub-costal mark, corresponding with the sub-costal part of the orange bar above. Two, sometimes three, black dots in the cell.

H.-w.: Ground colour and marks as in the f.-w.; one black dot in the cell; two diffuse whitish rings toward the anal angle.

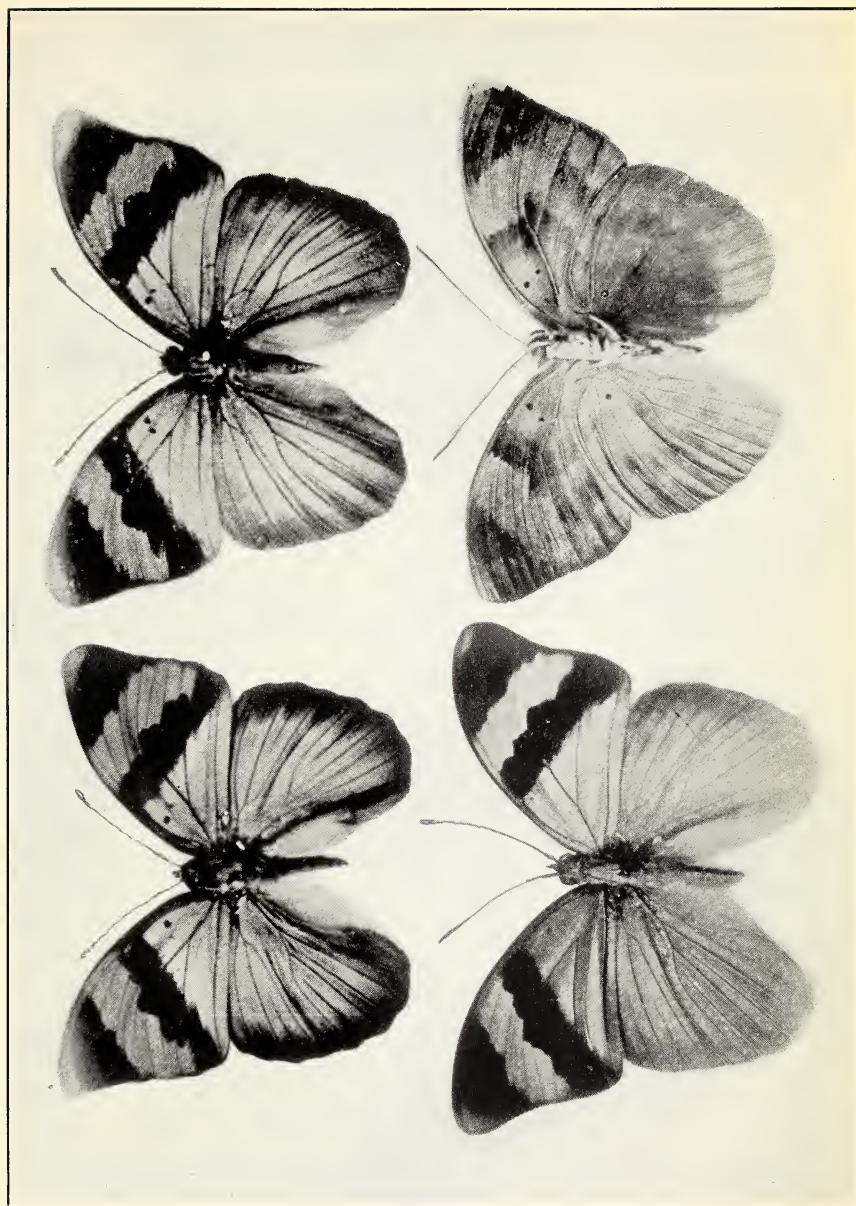
In some specimens the whole of the underside is tawny, with scarcely any darker brownish marks, but the orange bar of above is indicated by a yellowish tone.

FEMALE:

Very like the male, but larger. The black spots in the fore-wing cell larger and sometimes coalescent. H.-w. margin often with white fringing inter-nervularly.

UNDERSIDE:

F.-w.: Ground colour light purpley-grey-brown; cell with a whitish patch towards apex carrying two black dots on proximal edge; a



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Figs. 1 and 4. *Euphaedra neophron littoralis*, ♂.  
 Fig. 3. *Euphaedra neophron violacea*, ♂.  
 Fig. 2. *Euphaedra neophron menensis*, ♂.





pinkish-white bar corresponding in position to the orange bar above is continued through the mid-discocellular by two diffuse whitish spots to mid-point on hind margin; apex with whitish spot; two rows of white discocellular spots. There is sometimes a brownish dusting toward the base and toward the outer margin.

H.-w.: Ground colour as in the fore-wing; cell with one black dot surrounded by a diffuse whitish area, a whitish discocellular bar followed by two rows of sub-marginal spots forming more or less ocellate marks at the hind angle.

#### EARLY STAGES:

This species lays its eggs on two species of *Deinbollia*, *burbonica* and *kilimanscharica* (Sapindaceae), depositing them in groups or singly, on either the upper or underside of the leaves; sometimes on the flowering stem. The eggs are creamy to yellow with a decided pearly lustre when first laid, but they turn greyish, then almost black just before the larva emerges. The egg stage lasts about seven days. In shape the egg is domed, ornamented with hexagonal facets which are depressed and between the facets are spines. Vide Pl. A., fig 2.

When the larva first emerges it is somewhat transparent, of a greyish colour with a black head and adorned with lateral branched spines which are clear and transparent and hardly noticeable. No dorsal ornamentation is present until the third moult when a pink band appears on the 6th segment and a pink spot outlined in blue is apparent on the 2nd segment. With each successive moult, the colour becomes more green. The mature larva is sage green with darker green bands along the anterior and posterior edges of each segment and each has a dark central spot. There are two blackish spots on the dorsum of the 2nd segment on either side of the pink, and a long oval pinkish spot on the 6th segment. The lateral feathery spines are long, c. 10 mm., translucent greenish, and brownish at the tips with just a touch of blackish on the three pairs at the anal end. Each spine is adorned with numerous fine lateral spines, but the feathering is not so wide in this species as in *E. spatiosa*. The feathery spines of the first two segments are held in a forward position to cover the head; the lateral ones are contiguous and form a flat feathery border around the body, and lie in contact with the surface of the leaf on which the insect is resting. The usual position taken up is along the mid-rib of the leaf. The mature larva is 55 mm. in length, including the spines. When ready to pupate, the larva turns translucent and indication of the dorsal marks vanishes. The larva curls ventrally after spinning a pad of silk to which it attaches its hind suctorial "legs." It hangs suspended for roughly twelve hours before it actually pupates and the larval skin is shed. The skin is pushed off and closely compressed so that it eventually has the appearance of a feathery star.

The pupa is characteristic of the group. The colour is pale translucent apple green. The head is strongly bifid, the two projections are golden with black tips. From the dorsal aspect the thorax and wing cases form a long wedge with slight projections at the "shoulders" of the wings, and from the edge of the wing cases the abdominal segments are sharply truncated toward the cremaster. The dorsal aspect of the abdominal segments up to the edge of the third segment rise abruptly to a peak, to be followed by a slight depression over the fourth and fifth segments, followed again by another rise which slopes to the cremaster. The dorsal ornamentation is as follows: a golden spot at the wing "shoulders," two large golden spots outlined in black at mid-point between the head and the lateral angles; a heart-shaped golden spot at a point corresponding to the tip of the thorax; two large oval golden spots outlined with black at the angles of the wing and the abdomen, with a bluntly crescentic spot at the apex of the abdominal segments carrying a rounded projection on its concave edge; this is also golden and outlined with black. There is a further triangular golden mark at the centre of the dorsum of the 7th segment. The Cremaster is stalked, with two rounded projections laterally on the last and penultimate segments. On the ventral aspect the only marks are blackish streaks on the mid-point of the wing-cases.

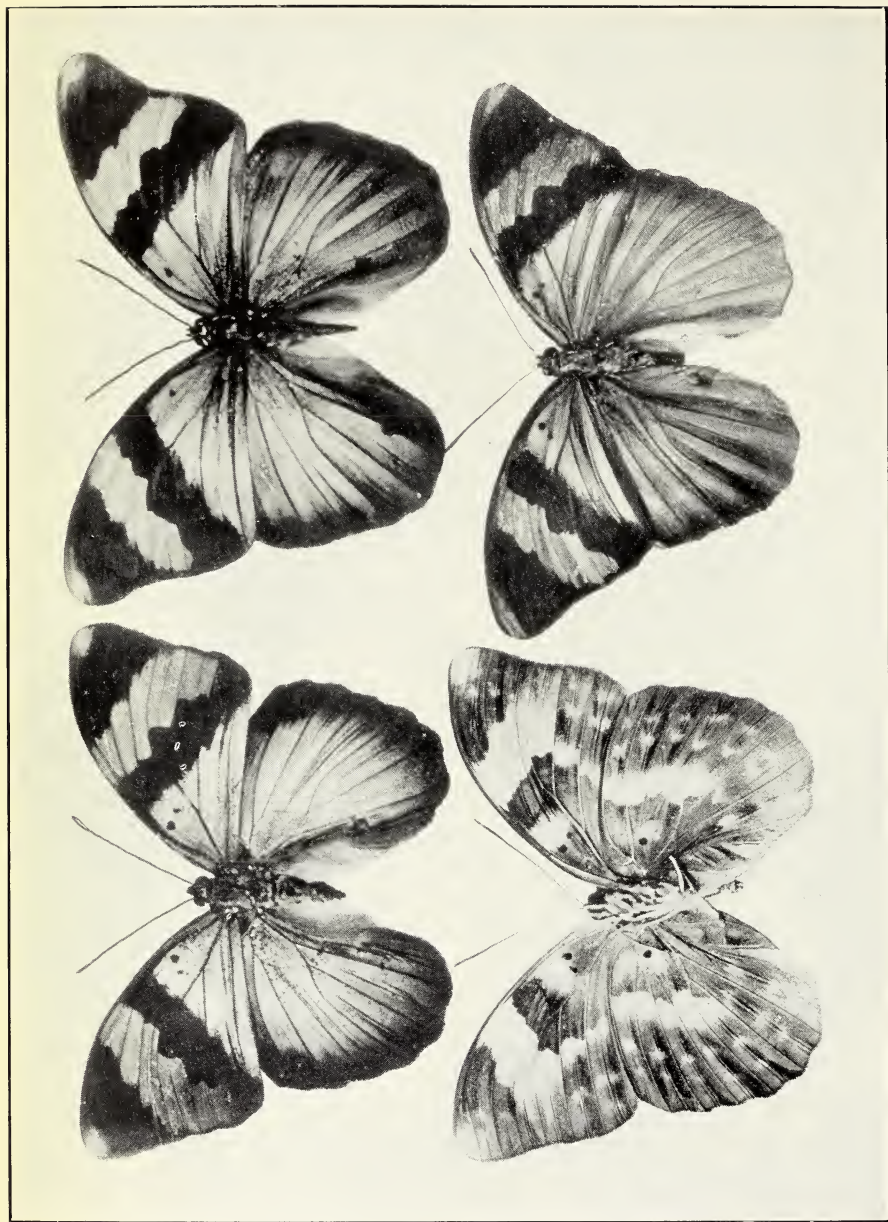
At the coast, the pupal stage lasts three weeks.

#### DISTRIBUTION AND HABITS:

Limited to the coastal forests and plantations of Kenya. It must be noted, however, that this coastal race is connected with two other races, namely *violacea* of the Kilimanjaro area, and to a lesser degree with *meruensis* of the Mt. Kenia rain forests; the linking with this latter takes place along the Tana River.

Although a forest species, this insect is found in almost all localities where there are any sheltering clumps of trees; thus one finds it in cocoanut plantations where mango and other fruit trees have been planted at intervals and a collection of other lesser trees have been allowed to grow up. It is common in certain parts of Mombasa Island where suitable conditions, as just described, exist. Nevertheless the presence of its food plant is essential, and fortunately this is a common species not only on the island but all along the coast. The females are more partial to shady places, but the males are given to flitting or rather gliding to and fro in shade interspersed with sunlit patches. Like others of this group, the flight is characteristic, consisting of one or two wing beats followed by a gliding with wings held horizontal so as to display the wonderful colours. This flight is always close to the ground and is very deceptive, as one learns by experience when attempting to capture the insect. It appears leisurely and slow, but





Figs. 1 and 2. *Euphaedra neophron littoralis*, ♀, upper and underside.  
 Fig. 3. *Euphaedra neophron niueensis*, ♀.  
 Fig. 4. *Euphaedra neophron violacea*, ♀.



the insects are quick sighted and can accelerate and avoid capture with ease. Females are usually found in the vicinity of the food plants, and they, and to a greater degree the males, are to be found feeding on rotting fruits which are fermenting.

*EUPHAEDRA NEOPHRON VIOLACAE*, Butl. Pl. I, fig. 3, ♂.  
Pl. II, fig. 4, ♀.

This race inhabits the Kilimanjaro area, and differs from the coastal form in the ground colour of the upper side; this is much more purply-violet.

There is the same difference in size between the sexes and in the colour of the under-surfaces. There is no difference in the early stages or habits.

#### DISTRIBUTION :

Is found throughout the forest on the foot-hills of Kilimanjaro, extending to the Taveta forest and lower Pare mountains and along the Lumi River. It occurs also in the Dabida district, but here we find intermediates toward the coastal race.

*EUPHAEDRA NEOPHRON MERUENSIS*, Sb.-sp. nov. Pl. I, fig. 2, ♂.  
Pl. II, fig. 3, ♀.

Intermediate in colour between the race *littoralis* and *violacea*, but differing from both in the shape of the fore-wing orange bar, more particularly on its proximal border which is less wavy and is not extended in a curve toward the hind-angle and does not reach vein 2; the median black bar is thus straighter and broader. Furthermore the outer edge of the fore-wing is distinctly brownish and carries a rusty fringe. The hind-wing smoky border shades into brownish and the fringe is rusty coloured. There is thus a tendency toward the race *ellenbecki*, Pag., of Abyssinia. Type, male, Meru Forest, Sept., 1927. Dr. van Someren Coll. A series of paratypes in my collection.

*EUPHAEDRA NEOPHRON ELLENBECKI*, Pag. (Not figured.)

Differs from the other East African races by being smaller and in having the basal portion of the fore-wing and the hind-wing yellow-brown and hardly differing in colour from the sub-apical bar of the fore-wing.

#### DISTRIBUTION :

This race is included on the evidence of a specimen taken by Col. S. A. Neave, March, 1912, Uchwenyi (? Itwani) Forest, near Witu.

*EUPHAEDRA MEDON FRAUDATA*, Thureau.

Pl. III, figs. 1—4, ♂♂.

Pl. IV, figs. 1 and 3, ♀, fig. 2, ♂.

= *inaequabilis*, Thur.

= *peculiaris*, Lathy.

Expanse: Male, 55-68 mm.; female, 60-98 mm. Sexes unlike.

General colour bottle green or olive-brown with sub-apical yellowish bar.

MALE:

F.-w.: Ground colour bottle-green with often a golden tinge; the cell usually with two black dots, and a black bar along the apex; the apical half of the wing is suffused with blackish scales, giving a dark appearance to this area; the tip is white, while the transverse sub-apical bar is yellow.

H.-w.: Uniform bottle-green, often with a golden tinge; margin dusky with a greyish fringe.

UNDERSIDE:

Dull yellowish-green; fore-wing cell with three black dots; tip white; a sub-costal white mark corresponding in position to the commencement of the sub-apical bar above; a sub-marginal ill-defined, often broken, darkish bar is present on fore and hind-wings; h.-w. cell with one or two black dots; an interrupted white bar from about the mid-point of the costa to the apex of the cell.

FEMALE:

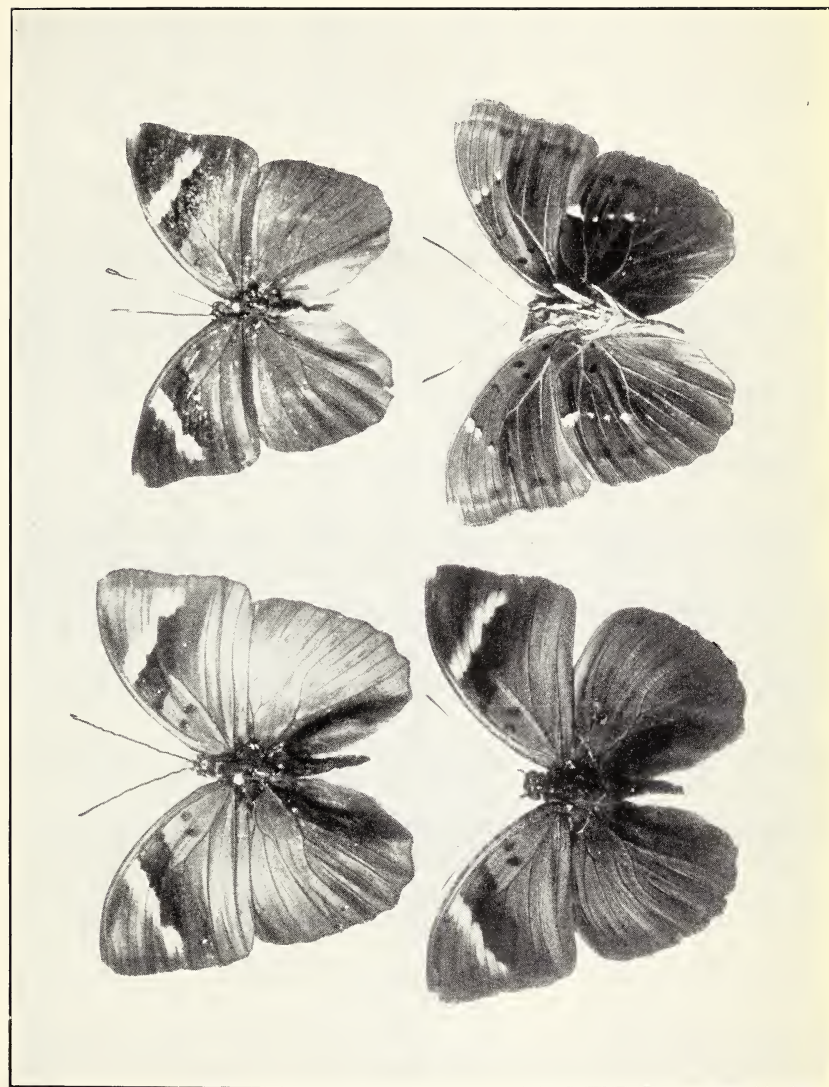
Ground colour golden-olive brown; fore-wing bluish along the mid-costa; apex with a white tip; apical half of wing darkened with blackish scales; sub-apical bar yellow, often with a greenish tinge. H.-w. uniform golden-olive brown with greyish fringe, and often with a purplish reflection along the margin.

UNDERSIDE:

F.-w.: Yellowish-olive with matt surface; two to three black dots in the cell; an interrupted white sub-apical bar; tip white; a series of dark greenish angled spots forming a sub-marginal bar.

H.-w.: Ground colour as fore-wing; cell with two black dots; an interrupted white bar from mid-costa to beyond the middle of the wing, the costal spot outlined proximally with black; a sub-marginal olive interrupted bar; fringe greyish.

In some males, the dark scaling of the fore-wing is limited to the proximal border of the sub-apical bar only, so that the apex is golden



Figs. 1-3. Variations of *Euphaedra medon fraudata*.  
Fig. 4. Underside.







PLATE IV.

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Figs. 1 and 3. Upper and underside of *Euphaedra medon fraudata*, ♀.  
Fig. 2. Variation of ♂ underside.

green like the base. There is sometimes a black spot at the apex of the cell on the underside. In both sexes, the ground colour is richer and darker when the insect is fresh but the colour fades out, both above and below, within a day or two, losing its bluish sheen and becoming more golden.

#### EARLY STAGES :

The food plant of this species is the Nkuzanyana of the Baganda, *Phialodiscus zambesiacus* (Sapindaceae). The eggs are deposited singly, on the upper surfaces of the leaves. They are pearly white when first laid, then darken, to become greyish two days before the larva emerges. In shape they are domed, the surface is covered with hexagonal facets, at the angles of which are glistening spines. The egg stage lasts seven days.

The newly emerged larva is translucent greyish-green, with a large black head, and fine transparent hairs project from the lateral aspect of each segment. The larva is unicolourous until the third moult when a pink band appears on the 8th segment. In this stage it is very similar to the larvae of other *Euphaedras*, the distinguishing feature being the colour of the dorsal band.

The mature larva measures 45 mm. in length; is pale sage-green in ground colour, with slightly darker bands on the front and back edge of each segment. The 8th segment is decorated with a bright pink band 3 mm. wide bordered by dark green. The feathery lateral projections are often 15 mm. long and lie with their margins touching. The position taken up by the resting larva is usually along the mid-rib of the leaf, and is very cryptic. The larval stage lasts from three weeks to a month. It pupates on the under surface of the leaf, either toward the margin or along the mid-rib. As the larva hangs it curves ventrally, and gradually becomes translucent, losing all trace of the dorsal mark.

The pupa is a translucent apple green, with gold-coloured ornamentation on the dorsum. Viewed dorsally, it presents the following characters: the head is bifid, each projection gold in colour with a black " comma " mark; at the latero-distal aspect of the head are two black streaks on a golden base, then follows a slight expansion at the shoulders of the wing-cases, each with a black crescentic mark on a golden spot; the apical projection of the thorax is golden with two parallel black dots; then follows a slight constriction corresponding with the commencement of the abdominal segments and then a more rapid widening out to the angle of the wing-cases; at this point there is a large conical golden mark outlined with black and carrying a black central dot; between the wing projections, the abdominal segments rise in an acute angle the apex of which has a golden elliptical mark with a black mark on the concave edge and two black dots on the

convex; the abdominal segments then taper rapidly to the cremaster which consists of a central stalk with two rounded knobs golden in colour and black spotted, one above the other; there is also a golden central spot in the mid-abdominal region. There is a lateral series of black dots along the spiracular line. The wing cases on the ventral surface are curved, and the abdominal segments strongly ventricose, and adorned with two golden spots, black-dotted.

The pupal stage lasts about a month, but is influenced by heat and humidity.

#### DISTRIBUTION AND HABITS:

This is a forest species which ranges throughout the forests of Uganda, and extends into the Kavirondo country. It is more plentiful in its western and central areas of distribution.

It is partial to the more open, less tangled parts where shade and shadow alternate with patches of sunlight. One finds them along forest paths which are shaded with overhanging trees. They prefer places where the ground is damp and the atmosphere humid. Males are more in evidence than females, for these latter seek the open spaces in the undergrowth and are difficult to detect, unless one has the fortune to observe them ovipositing; they then flit about from one food plant to another, pausing just long enough to deposit an egg. After laying three or four they settle on the damp mould of the floor of the forest usually in some little patch of sunlight, with their wings outspread. Males are partial to sun-basking, and will rest on some low herb with out-spread wings, or often on the ground, but ever alert. When disturbed they fly low; two or three rapid wing beats, a low glide, and they settle. They will maintain this manoeuvre for quite a long distance along a pathway, keeping just out of reach of the net, before they suddenly turn off into the undergrowth. They feed largely on decaying fruits which have fallen to the ground.

The females are very similar in colour to the next species, and both enter into the mimetic association with the various forms of *Charaxes* females already cited in the introductory notes. The white bar on the under-surface of the hind wings helps to distinguish these females from the following species.

*EUPHAEDRA SPATIOSA*, Mab. Pl. V & VI, figs. 1 and 2, ♂ and ♀.

Expanse: Male 80-95 mm. Female 95-120 mm. General colour olive-brown with sub-apical yellow bar on dark ground. Sexes very similar.

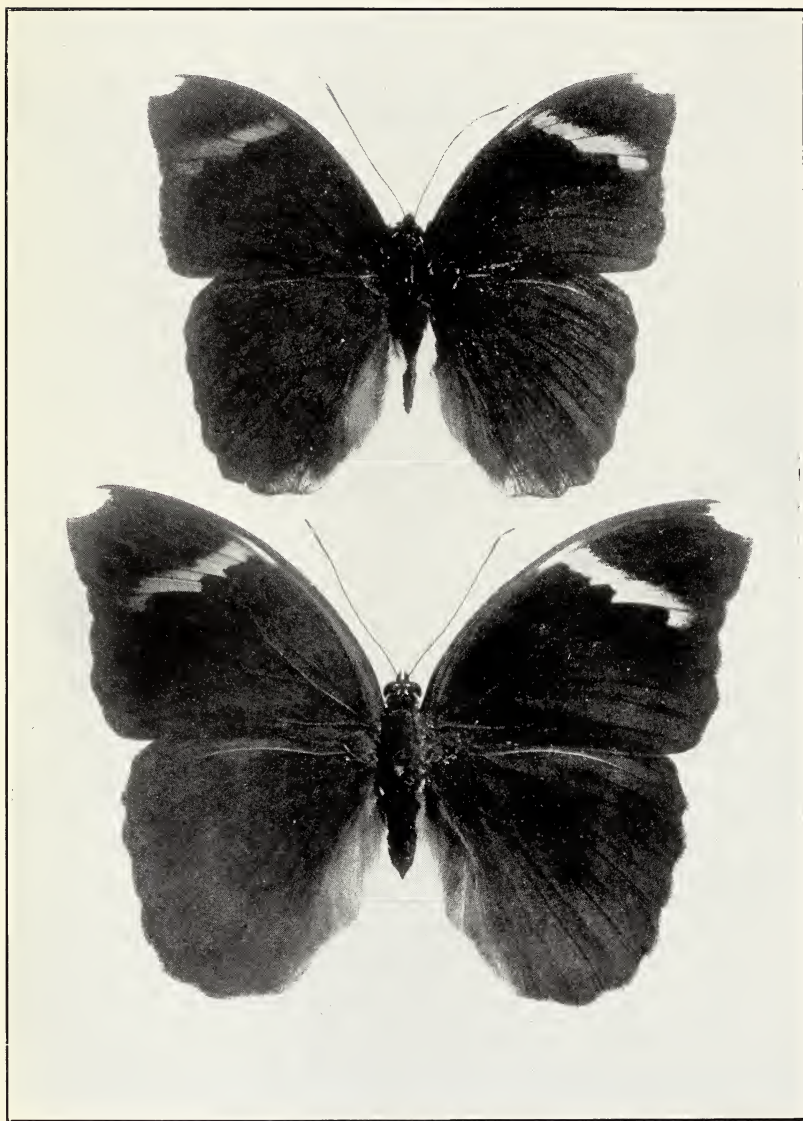
#### MALE:

F.-w.: Basal half of costa bluish-green; basal half of wing olive-green-brown; apical half from apex of cell to mid-point on outer





PLATE V.



*Euphaedra spatiosa*, ♂ and ♀. Upper surfaces.



PLATE VI.



*Euphaedra spatiosa*, ♂ and ♀. Upper surfaces.



margin, olive-black; tip with conspicuous white spot, sometimes the white extending along the edge of costa; a sub-apical yellow bar almost straight along the distal margin, indented on the proximal margin, average width 5 mm. and with a yellow streak along the hind-costal margin.

H.-w. : Unicolourous olive-green-brown, with a whitish fringe. In fresh specimens the general ground colour is deeper, more olive, less brown. Many of the males have a strong purple-blue to bronze iridescence at the anal angle of the hind-wing.

#### UNDERSIDE. BOTH SEXES :

Ground colour matt olive-grey, sometimes with a bluish green tinge; a black spot in the f.-w. cell; tip of wing white; costa slightly ochreous whitish at base; a whitish sub-apical bar corresponding to half the bar on the upper side. H.-w. with a black spot in the cell; a whitish bar from mid-costa toward apex of cell. Both wings with a dark olivaceous bar beyond the middle, outlined distally with crescentic light hoops, the tips of the hoops touching a sub-marginal pale bar conforming to the outline of the wing.

#### EARLY STAGES :

This species lays its eggs singly on the upper surfaces of the leaves of sapling plants of *Phialodiscus zambesiacus* and *Paulinnia pinnata* (Sapindaceae). The egg is a beautiful object when viewed through a magnifying glass, especially with sunlight on it. It is dome-shaped covered with depressed facets hexagonal in outline and between the facets there are flexible spines. The facets and spines glisten with a pearly lustre. The whole egg reminds one of the form of an Echinoderm. The egg takes seven days to mature. The newly emerged larva is translucent white with fine black hairs set out from the lateral aspect of each segment, save the last. Each hair or spike is covered in fine white lateral spines. The head is dark brown with a black midline. It remains this colour until the third moult. It then turns grey-green still with a semi-translucent appearance and most of the lateral feathery spines become translucent greenish save at the tips and base which remain dark; the first and last pair remain dark throughout their length but the lateral feathering is white. A blue-black band appears across the 8th segment and the head turns brown. The mature larva is a strikingly beautiful object 70 mm. long, of a pale sage green, slightly darker along the front and hind margins of each segment. The blue-black band on the 8th segment stands out conspicuously. The lateral body feathering is developed to a maximum. Those on the first segment are directed forward over the head; the last pair backward over the anal segment. All are bluish-grey, darker at the base and yellowish at the tips.

The larva lies along the mid-rib of the leaf when at rest, with the lateral feathered spines in contact with the surface of the leaf. They are somewhat sluggish and very prone to bacterial infection, and when this happens they liquify and decompose rapidly. When about to pupate the larva selects a spot usually on the projecting mid-rib on the under-surface of a leaf or sometimes on a twig and here spins a silken base to which it attaches its hind suctorial legs. It then curls ventrally and brings the feathery lateral spines forward to cover the ventral surface. The skin is shed within twenty-four hours.

The pupa is similar in general characteristics to many of this group. The colour is a pale translucent green ornamented with large golden spots accentuated with black. The general distribution of the golden marks is similar to that of the previous species, but the marks are larger, and the abdominal prominence is more accentuated.

#### DISTRIBUTION AND HABITS:

These insects are entirely inhabitants of the thick shady forests of Uganda, and are found resting on the ground or skimming low over the surface of some forest path where sunlight alternates with shade. They rest with their wings outspread, and though of a large size are elusive and difficult to capture. Females are much more addicted to the shade of the undergrowth than are the males, but both sexes feed on the juices of fallen decomposing and fermenting fruits and berries.

#### *EUPHAEDRA UGANDA UGANDA*, Auriv.

Pl. VII, figs. 1 and 2, ♂, fig. 3, ♀.

Pl. VIII, figs. 1 and 2, ♀♀.

Expanse: Male 75-88 mm. Female 100-110 mm. Sexes unlike.

#### MALE:

F.-w. mostly a rich blue-black, with a blue costa, a purply-blue base and a patch of the same colour toward the middle of the hind margin. A sub-apical white bar consisting of three to four spots, tinged violet-blue on the margins; varies in width from 2-5 mm. A small white tip at apex; margin slightly scalloped,

H.-w.: Strongly violet-purply-blue in the central area dusky at margins; margin strongly scalloped and bearing white internervular spots. The blue-violet colour changes to a more purply tone when the first bloom of the freshly emerged insect goes.

#### UNDERSIDE:

Matt grey-blue with greenish tinge; three black spots in the cell, with one at apex; a sub-apical whitish bar. H.-w.: Ground colour similar; one black dot in cell; an indistinct whitish bar beyond the middle, more pronounced at the costa.



Figs. 1 and 2. *Euphaedra uganda uganda*, ♂.  
Fig. 3. *Euphaedra uganda uganda*, ♀.







PLATE VIII.



*Euphaedra uganda uganda*, ♀. Undersurfaces.

#### FEMALE :

Somewhat variable. F.-w. : General ground colour sooty-black with violet along the costa, at the base and along hind margin expanding to a distinct violet-blue area at the centre of the hind-margin; tip narrowly white; sub-apical bar white, consisting of four white spots edged with blue. H.-w. with sooty brown-black ground colour with a strong purply patch in the centre. Both wings scalloped, the hind one, more so. Underside as in the male three large black spots in the cell of f.-w., one in hind-wing cell.

#### EARLY STAGES :

The eggs of this species are laid singly or in twos on the upper surface of the young plants of *Rhus subcoriaceus* (Sapindaceae), also on *Paulinnia pinnata* of the same family. They are a high dome covered with depressed facets, hexagonal in outline and between each facet is a spine. These spines are recumbent when the egg is first laid, but spring up as the surface dries. The colour of the egg is pearly white and glistens.

The larva emerges in seven days, and is at first a translucent grey-green with short lateral spines and a black head. This colouration is maintained until the third moult, when the head turns brownish and a dorsal deep pink bar appears on the 8th segment. The larva is then pale green. At the next moult it becomes sage green in colour, with the dorsal mark more prominent; the feathered latero-dorsal spines are 12 mm. in length and translucent green, with just a faint tinge of ochreous at the tip. As the larva rests these spines spread out around it so that the whole of the body outline is covered and the general outline is a long oval 45 mm. x 30 mm.

The pupa is very similar to that of *E. medon*, but is not so ornamented with golden spots on the pale apple-green ground colour.

#### DISTRIBUTION AND HABITS :

Most plentiful in the forests of Uganda : Budongo, Bugoma, Tero, Mawakota, Mabira, Entebbe, and the forests of Busoga.

Like others of this group their habitat is the deep shady forest with damp floor to which sunlight penetrates in patches. They keep low to the ground in flight and when at rest; the females only rising to a few feet when depositing their ova.

They sit with their wings almost completely spread, but of an evening when roosting the wings are closed.

*EUPHAEDRA* (UGANDA) f. NITIDULA, Nom. nov.

Pl. IX, figs. 1 and 3, ♂ and ♀.

Pl. X, figs. 1 and 3, ♂ and ♀.

= *E. uganda viridis*, Roths.\*

Expanse: Male 75-80 mm. Female 90-105 mm. Sexes unlike.

MALE:

F.-w.: Greater part of distal portion of the wing black; costa, base and hind margin, blue-green to posterior angle; the black extending to, and filling half or more of the cell; tip of wing with a narrow white tip; wing strongly scalloped with white spot in each depression; sub-apical bar white with greenish tinge along edges, composed of three large, and one small, spots. Two darker black spots visible in the cell.

H.-w.: Base and margin blackish, rest of wing blue-green; a sub-marginal row of diffuse greenish spots follow the contour of the outer margin of the wing.

UNDERSIDE:

Matt grey-green sometimes with a bluish tinge; three, two, or one black spots in the cell; sub-apical bar white as also the tip of the wing and the indentations on the border. H.-w. with a similar ground colour with a diffuse whitish bar just beyond the middle, widest at sub-costa; a row of whitish sub-marginal spots are just visible. One black spot in cell.

FEMALE:

F.-w.: Base of wing to hind angle, and base of costa, violet purple, scaling most visible just beyond middle of hind margin on a brownish base; rest of wing brown-black; tip narrowly white; margin strongly scalloped, and concave between veins 4 and 5, giving the apical portion an elongate appearance; sub-apical bar of four spots, white with violet tinge at edge, particularly on the last spot.

H.-w.: Ground colour brownish, slightly darker at margin and base and with a strong purple scaling in the centre of the disc to the anal angle; sometimes a series of paler violet-purple sub-marginal spots present. Margin strongly scalloped with white spot in each indentation.

Underside as in the male.

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\* The name *viridis* is preoccupied by *viridis*, Suffert., and a substitute name is here used.





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Figs. 1 and 3. *Euphaedra (aganda) nitidula*, ♂ and ♀.  
 Figs. 2 and 4. *Euphaedra (aganda) kakauegae*, ♀ and ♂.





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Figs. 1 and 3. *Euphaedra (uganda) nitidula*, ♂ and ♀ undersurfaces.  
Figs. 2 and 4. *Euphaedra (uganda) kakamegae*, ♀ and ♂ undersurfaces.





#### EARLY STAGES :

As for *E. uganda*. This insect has been described as merely a form of *E. uganda*. It is true that their distribution coincides to a certain extent, but such breeding of the two as has been done by me, has shown that the two breed true to type and furthermore, the *nitidula* form has a greater extension eastward, and is represented in the Kakamega-Nandi area by a form which is described later. In addition, the fore-wing in the female is more acuminate and the margin more strongly scalloped. For the time being I prefer to keep the two distinct. There is a strong similarity of marking on the underside between this insect and *E. preussi*.

#### DISTRIBUTION AND HABITS :

As already mentioned, the range of this insect is from the forests of Western Uganda to those of the Eastern Province in Busoga, and thence eastward to Nandi as a distinct form. In habits they resemble *E. uganda*.

*EUPHAEDRA (UGANDA) KAKAMEGAE*. Sub.-sp. Nov.

Pl. IX, figs. 4 and 2, ♂ and ♀.

Pl. X, figs. 2 and 4, ♀ and ♂.

#### MALE :

In size, this race agrees with typical *nitidula*. It differs in having the upper surface more strongly blue-green, and the margins of the wings more strongly scalloped. The distal black area of the fore-wing is more restricted, so that the black spots in the cell are more clearly visible. The under-surface presents a striking difference: the ground colour is more tinged with olive-green, on the grey-base; the spots in the cell are very prominent; the sub-apical white bar is distinct, and beside the white tip and the white at the marginal indentations, there is a series of grey-blue sub-marginal spots running from the costa to the hind-angle. The hind-wing is olive-grey-green with a discal bar just beyond the middle; a series of sub-marginal grey-blue large spots follow the contour of the wing from the costa to the anal angle; the indentations on the margin of the wing have white streaks.

#### FEMALE :

Upper side, very similar to that of *nitidula*, but the sub-apical bar is wider and purer white; and the purple-violet scaling on the discs of both wings stronger. The underside is a replica of that of the male, but the white and blue-grey marks are even more distinct, and thus there is a strong resemblance to *E. preussi*.

#### EARLY STAGES :

This race has not been bred to my knowledge.

#### DISTRIBUTION AND HABITS:

The range of this form is confined to the forests of North Kavirondo to Nandi, and Kisii.

Type: Male, Kakamega, March, 1934. Jackson leg. in Nairobi Museum. A long series in the Jackson col. and others in the Nairobi Museum.

*EUPHAEDRA OLIVACEA*, Grunb. Pl. XI, figs. 2 and 4, ♂ ♂.

Pl. XII, figs. 3 and 4, ♀ ♀. Pl. XIII, figs. 2 and 4, ♀ ♂.

Expanse: Male 70-75 mm. Female 90-100 mm. Sexes unlike.

#### MALE:

F.-w.: Costa and basal half of wing bottle-green with golden or blue reflections according to lighting; apical half only slightly darker or may be suffused with black scaling; two diffuse black spots in the cell; apex narrowly white tipped; sub-apical bar white and narrow, consisting of four oblique marks; wing fringe greyish, with white dots at the indentations. N.B.—Some individuals have the dark apical suffusion extending toward the base of the cell and reaching vein 2; thus more like *E. preussi* of which *olivacea* is considered a race by many.

H.-w.: Uniform bottle-green with reflections as described above; margin slightly dusky, with the fringe greyish and white spotted in the indentations of the margin. Some individuals have a strong bluish iridescence at the anal angle and at the cell.

#### UNDERSIDE:

Uniform matt grey-green with a brownish tinge; cell with two, three or four spots, the last at the apex; the sub-apical bar clear and white. H.-w.: Ground colour as fore, with a whitish streak along the costa up to vein 7; a diffuse interrupted whitish "flare" across the wing just beyond the middle; slight indications of grey-blue sub-marginal row of spots; white streaks in marginal indentations.

#### FEMALE:

F.-w.: Ground colour bronzy-brown with purple suffusion at base, and blue along the base of the costa; apical half suffused with blackish scales from the apex of the cell to the hind angle. In some individuals the black extends into the cell and obscures the two blackish spots which are otherwise visible; tip narrowly white, and some white in indentations at margin. Sub-apical bar narrow and white. H.-w.: Ground colour bronzy-brown with purple suffusion over mid-discal area; some dusky scaling along the margin, and sometimes an indication of sub-marginal spotting.



Figs. 1 and 3. *Euphaedra preussi*, ♂ ♂.  
 Figs. 2 and 4. *Euphaedra (preussi) olivacea*, ♂ ♂.









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Figs. 1 and 2. *Euphaedra preussi*, ♀ ♀.  
Figs. 3 and 4. *Euphaedra preussi olivacea*, ♀ ♀.





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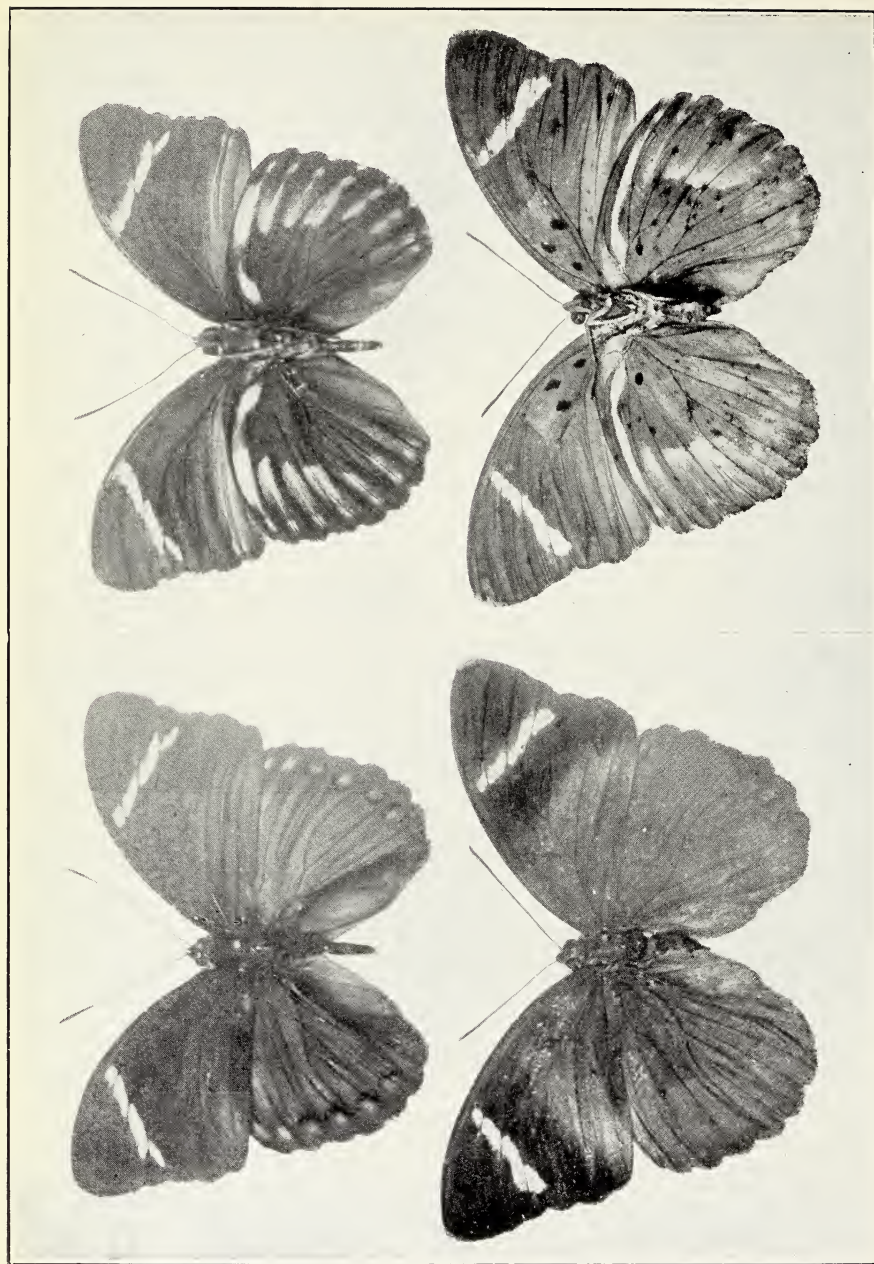
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Figs. 2 and 4. *Euphaedra (preussi) olivacea*, ♀ and ♂.  
Figs. 1 and 3. *Euphaedra preussi preussi*, ♀ and ♂.







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Figs. 1 and 2. *Euphaedra preussi* f. *sordida*, ♂ and ♀.  
Figs. 3 and 4. *Euphaedra preussi* f. *sordida*, undersurfaces.

#### UNDERSIDE :

F.-w. : Bluish-grey with purple tinge toward hind margin; cell with three black spots and sometimes one at apex; sub-apical bar white and distinct; white marginal spots more clear than above.

H.-w. : Ground colour as fore-wing; cell with one large black spot; a bluish to white streak along costal margin continuous with a whitish bar clear cut proximally, diffuse distally just beyond the middle; diffuse greyish sub-marginal spots present; white streaks on edge, at indentations, clear.

EARLY STAGES : Not yet bred.

#### DISTRIBUTION :

The forested areas of Central Uganda to Busoga.

*EUPHAEDRA (PRESUSI) f. SORDIDA*, Talbot. Pl. XIV, figs. 1—4.

Expanse : Similar to the preceding.

Described by Talbot as a sub-species of *preussi*. *Trans. Ent. Soc.*, 1929.

“ Allied to *olivacea*, Grunb.; much darker, and with a row of sub-marginal spots on the hind-wing.”

#### MALE :

Resembles *olivacea*, but is more bluish-green. F.-w. : Above with the median area to the sub-apical band blackened. Sub-apical band very narrow, white, and more oblique than in *olivacea*, the two middle spots longer than in this form, the one in 4 extending more distal. Hind-wing with a weakly defined black distal border bearing a series of bluish-green sub-marginal spots.

#### UNDERSIDE :

Olivaceous mixed with ferruginous, darker than in *olivacea*. F.-w. in the sub-median area dusted with bluish-white. H.-w. with a post-discal band of white stripes, the anterior three nearly equal, the posterior three short and narrow; some of these stripes almost touch the sub-marginal bluish-white spots; the usual white sub-costal stripe is partly broken up by the ground-colour at its middle.

#### FEMALE :

F.-w. : Proximal half violet-blue, distal half black-brown. White sub-apical band a little broader than in *olivacea* and agreeing with the male in its shape, the more distal extension of the stripe in 4 always distinguishing this band from the one in *olivacea*. H.-w. : Violet-blue excepting a black-brown border; a sub-marginal row of olive-blue spots.

#### UNDERSIDE:

Ferruginous marked with bluish-white. Fore-wing dusted with bluish-white over the median and sub-median areas. Hind-wing very strongly marked with bluish-white; a post-discal band is merged with a white proximal area, and distally extends to the bluish-white sub-marginal spots. The bluish-white sub-costal stripe is almost broken near its middle by a dark patch, and vein 8 is striped with blackish."

Type: Male and female in Oxford U. Museum. Paratypes Nairobi Museum. Dr. van Someren, Mawakota, Uganda.

#### DISTRIBUTION AND HABITS:

This form is so far noted only from the central forested areas of Uganda.

*EUPHAEDRA (PREUSSI) f. LACTEATA*, Talbot.

Pl. XV, figs. 1 and 2.

*Trans. Ent. Soc.*, Dec., 1929.

This was described from a female and male, but the description is based on the former.

#### FEMALE:

"Distinguished from other forms by its bluish-white colouration. Probably a phase of the previously described race. F.-w.: Above with proximal area bluish-white faintly dusted with yellowish brown, extending in one specimen to cellule 3, and occupying the usual blue or brown area seen in all *preussi* and *eleus* form. The distal black-brown area is shot with deep blue. A sub-apical band of four spots, the one in 4 somewhat oblong in the type and narrower and more oblique in the paratype.

"H.-w. of the same colour as proximal area of fore-wing. A broad black-brown marginal border as in *eleus*, Drury, bearing a series of eight white spots which are slightly edged with blue proximally.

#### UNDERSIDE:

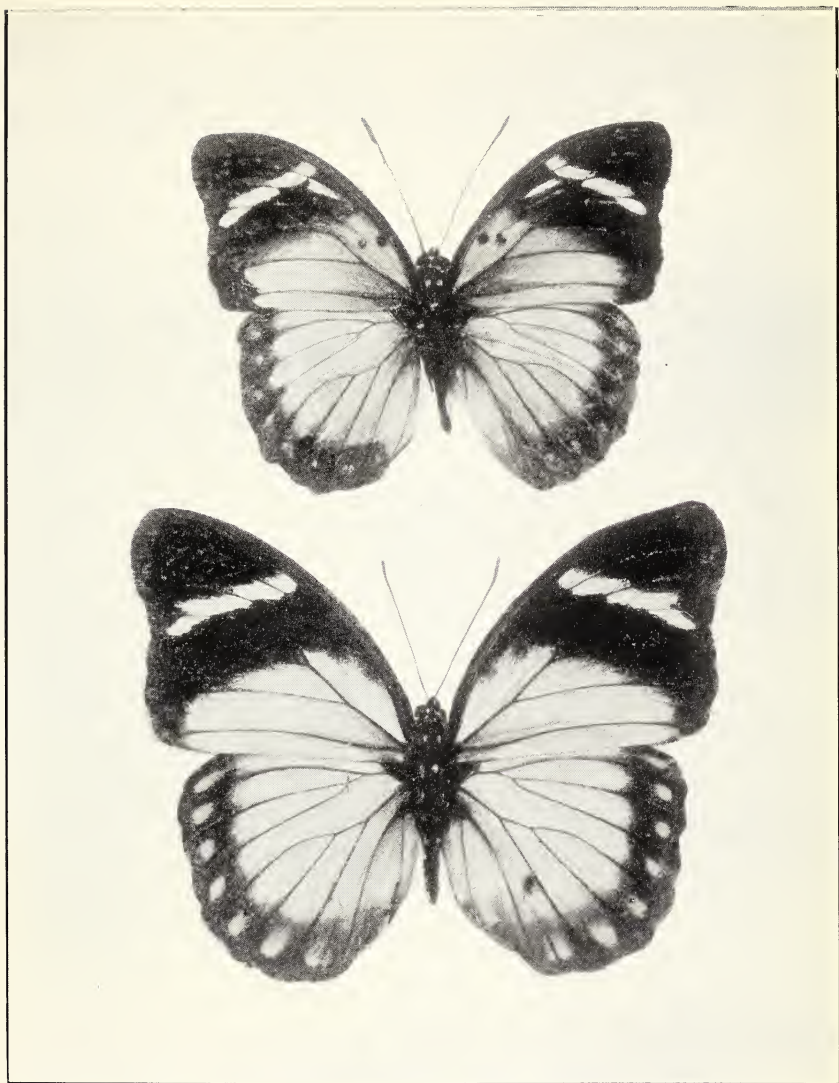
"Ferruginous, paler over the areas which are white on the upper-side. Cell of fore-wing with two black spots in the middle, a black point near its base and two black dots against the disco-cellulars 4 and 5. Hind-wing with a broad white sub-costal stripe almost reaching the sub-marginal spot in 7, traces of white post-discal patches, a black dot in cell below origin of vein 7, and sub-marginal spot as above, edged with bluish-black proximally.

#### MALE:

"Upperside colouration similar to the female f.-w. with the basal area dusted and tinged with green. Two small rounded black spots



PLATE XV.



*Euphaedra preussi* f. *lacteata*, ♂ and ♀.



in middle of cell; sub-apical band narrower than in the female. Underside similar to the female paratype. Fore-wing with the two black cell-spots as above, the lower one obsolete. H.-w. with the discal band strongly marked."

Female type: Buamba Forest, Uganda. G. D. H. Carpenter and Dr. Wiggins. Male allotype and female type, Mawakota Forest, Dr. van Someren.

*EUPHAEDRA PREUSSI* NJAMI, Staud. Pl. XXVIII, fig. 1.

FEMALE:

Costa blue-green to almost the tip; basal area blue-green, becoming paler and more bluish over hind marginal area to hind angle and reaching cellule 2. Distal portion of wing blue-black, sub-apical band white, of four spots, the third largest and longest, the fourth set distal. The black area extends to the greater part of the cell and obscures two dark spots.

H.-w.: Pale bluish particularly centrally, and darker at the base: a blackish marginal border with bluish diffuse spots.

UNDERSIDE:

Ferruginous green, more rusty basally. Cell with three large black spots; a whitish streak below the costa contiguous with the white sub-apical band; tip white as also the indentations on the margin; a series of indistinct bluish sub-marginal spots most apparent at hind-angle.

DISTRIBUTION:

On the extreme western forests of Uganda, Buamba Forest. This is an intermediate form toward *lacteata*, Talbot.

*EUPHAEDRA PREUSSI*. Pl. XI, figs. 1 and 3, ♂ ♂.

Pl. XII, figs. 1 and 2, ♀ ♀. Pl. XIII, figs. 1 and 3, ♀ and ♂.

Expanse of both sexes similar to *olivacea*.

MALE:

Costa and basal area rich dark blue-green from mid-cell to posterior angle; distal portion of wing dark green-black, darker on the proximal edge of the sub-apical bar; sub-apical bar white or tinged with creamy, narrow, the fourth spot narrower and set distal to the third. Two black spots sometimes visible in the cell.

H.-w.: Mostly dark blue-green, slightly blackish on the marginal border and purplish along costa; a sub-marginal row of indistinct bluish spots.

#### UNDERSIDE:

Dull olive-green, slightly ferruginous at base; three black spots in the cell, and sometimes a black mark at apex; a sub-apical band, white, as above. H.-w.: Ground colour as fore, with a marked sub-costal bluish streak; one black spot in cell; very small sub-marginal dots and a slight bluish "flare" in the post-discal area, not forming a bar.

#### FEMALE:

Basal area bronzy-brown with purple reflections proximally and along the costa; in area 1b colour paler; distal portion of wing brown-black from the apex of the cell to hind-angle, or from mid-cell; two black spots in cell; tip white edged; sub-apical band white and narrow and almost parallel sided. H.-w.: bronzy-brown with a strong purple suffusion over the whole, except the marginal border which is dusky brown.

#### UNDERSIDE:

F.-w.: Tip white edged; ground colour olive matt, with lilac tinge at hind border; cell with two or three black spots. Sometimes the ground colour is strongly tinged ferruginous.

H.-w.: Ground colour as in the fore-wing; the usual sub-costal white to bluish streak is present; there is no distinct post-discal pale band, but a diffuse "flare" of bluish most distinct beyond the cell. No sub-marginal series of spots, or only very small and faintly indicated.

#### EARLY STAGES:

This has not been bred.

#### DISTRIBUTION AND HABITS:

This type of *preussi* is found in the forests of Western Uganda, particularly in the Bugoma-Budongo areas. It is richer and darker than the form *olivacea*.

*EUPHAEDRA PARADOXA*, Neave. Pl. XVI, figs. 1—6, ♂ ♂  
Pl. XVII, figs. 1—5, ♂ ♂.

This is a very variable species and the following notes and descriptions of new forms are the result of a critical examination carried out by Prof. Hale Carpenter and myself. Before dealing with the entire material at my disposal, some 130 specimens, and indicating the variations and intermediate forms we will give the results of the examination.

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NOTES on *Euphaedra paradoxa*, Neave, with descriptions of new forms, by Prof. G. D. Hale Carpenter and V. G. L. van Someren.

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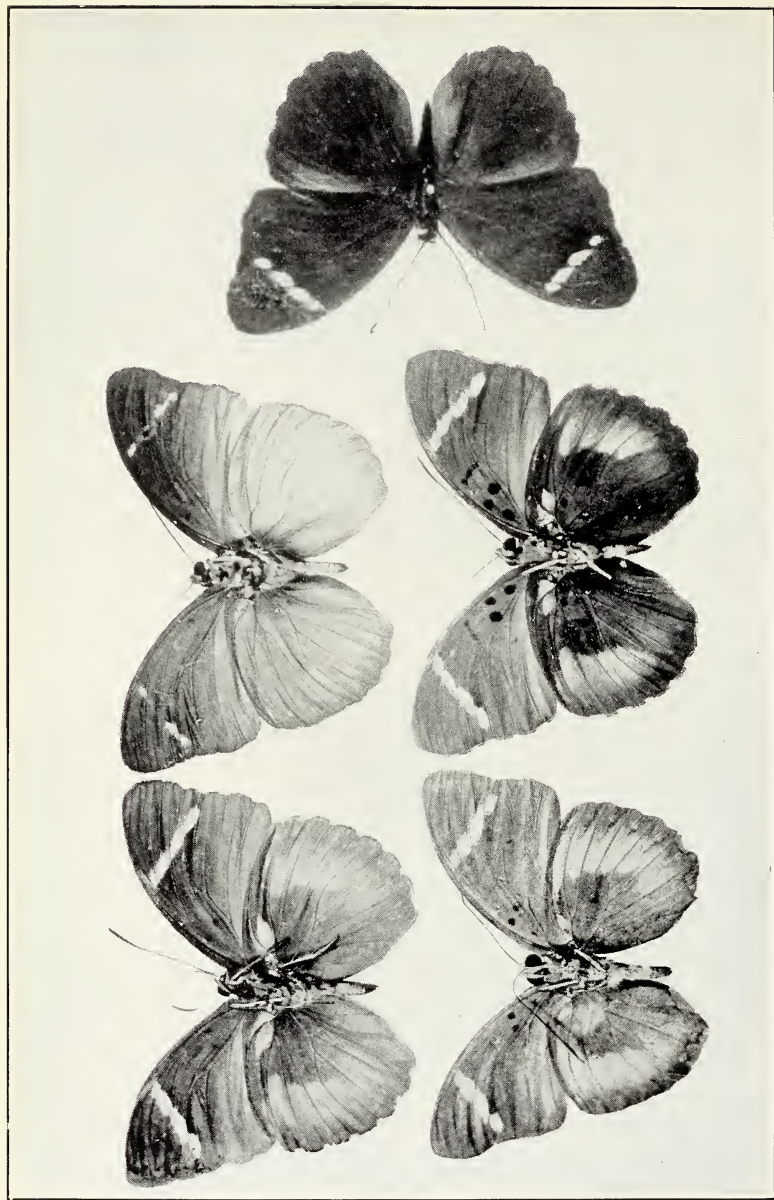
PLATE XVI.



*Euphaedra paradoxa paradoxa*, showing variation in the ♂.



PLATE XVII.



*Euphaedra paradoxa paradoxa*, ♂♂.  
Figs. 1-4. Variation on underside.  
Fig 5. A melanistic variety.



The original description of the species is as follows:—

"*Euphaedra paradoxa*, sp. nov. Neave. Nov. Zool, 1904, XL, pp. 333-34.

"**FEMALE:** Dull red-brown with glossy greenish-black margin. Upperside: Fore-wing glossy greenish-black with a narrow dirty white oblique sub-apical bar extending from sub-costal nervule to near distal margin halfway between third radial and first median nervules. Starting from inner margin from base to near posterior angle is a patch of dull red-brown with a slight green tint running up to and invading the base of cell and angle between median nervure and second median nervule.

"**Hind-wing:** The same dull red-brown colour, with a narrow uniform distal margin of glossy greenish-black, bearing inter-nervular spots of paler green.

"**Upperside:** A dull pale olive-green, paler toward the margins.

"**Fore-wing:** Costa buff coloured at base and again toward the apex. Sub-apical bar white.

"**Hind-wing:** Basal and middle portions darker green, considerably paler in discal area. A row of very faint greenish sub-marginal spots in internervular spaces of distal margin. Inner margin and internal and sub-median nervures covered with buff-coloured hairs. Fringe blackish, dotted with white, especially at apex of fore-wing. Expanse 62 mm. Type, female, Ugaia, South Kavirondo, January, 1903." (N.B.—The type is really a male.—Authors.)

The original description of this species quoted above, alluded to the type as a female. It proves, however, to be a male. As a result of examination of a long series of this insect from practically the type locality, South Kavirondo to the north-east of Lake Victoria, the following notes are possible.

The type male, on the upper surface is obviously an intermediate between the red-brown form, with the general resemblance to *E. cleus*, and a dark green form such as *E. preussi preussi* or *E. medon*. The narrow sub-apical whitish band is set less transversely and more antero-posteriorly than in most species except *preussi* which seems very closely related. The chief difference from *preussi* is on the underside where the strongly-marked white stripe on the costal margin of the hind-wing is lacking or may be faintly suggested at the root of the sub-costal nerve toward the base of the wing. Three black spots are indicated in the cell of the fore-wing by a few black scales; when present in other specimens they are seen to be poorly developed compared with *preussi*, or even with *medon* in which they are smaller and less well developed than in *preussi*. The pale marks on the under-surface of the hind-wing are more correctly termed "greenish-white" and form a continuous patch as in *E. uganda*, crossing the outer half

of the wing from vein 8 and 3. The outline on the proximal edge of this pale area corresponds closely with a less well defined difference of shade in the same place in the male of *preussi preussi*.

The series obtained contains certain well marked forms to which no names have been given. The following are therefore proposed:

- (1) A form of *paradoxa* male which very closely resembles the normal bronze-green male of *preussi preussi*, Stgr. For this we propose the name *PREUSSOIDES*, f. nov. Pl. XVIII, figs. 1—4.

The very narrow whitish sub-apical bar, slightly narrower than in *preussi*, is, as in the *paradoxa* form, set somewhat less transversely than in most *Euphaedra*, and is greenish-white. The hind border of the hind-wing has a sub-marginal row of dark angular spots, better defined than in *preussi*, which mark the inner edge of the slightly paler "internervular spots of the paler green" described for the type *paradoxa*.

The underside does not differ appreciably from that of the type, but the three spots in the cell of the fore-wing, one near the base and two distal, are distinct, though smaller than in *preussi*. In the type specimen of *p. preussoides* there are no spots on the hind-wing under-surface: another specimen has one near the root of vein 7. Other paratypes have the bases of the costa of fore and hind-wing on the under-surface yellowish, and some have the apical portion of the fore-wing dusted with the same colour.

Type, male, Suna, South Kavirondo, Kenya Colony, April, 1932, Dr. van Someren. In Hope Dept., Oxford University Museum; paratypes, and 15 topotypes in Coll. van Someren.

The so-called female type of *paradoxa* being really a male, the female allotype is here described. The specimen selected is one nearest in appearance to the male type.

#### *E. paradoxa paradoxa*, female ALLOTYPE

Sub-apical bar white instead of dirty-white as in the male, and is divided into three sections by black scales along veins 4 and 5. The large pale areas are red-brown with a strong green tinge; the pattern as in the male. The hind-wing has a more defined sub-marginal row of spots than in the male; they appear as black-bordered slightly bluish lunules. The under-surfaces shows little difference from that of the male, except that there are traces of whitish spots in the position of the lunular marks of the upper side.

Allotype, female, Suna, South Kavirondo, Kenya Colony, April, 1932, in Hope Dept., Oxford University Museum. Paratypes in Coll. van Someren. 14 specimens.



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*Euphaedra paradoxa* f. *preussoides*.  
Figs. 1 and 3, ♂. Figs. 2 and 4, ♀.







PLATE XIX.



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*Euphaedra paradoxa* f. *rufescens*. Figs. 1-4, ♀ ♀.



*Euphaedra paradoxa* undersurfaces.  
Fig. 1, f. *rufescens*. Fig. 3, f. *vansomeri*. Figs. 2 and 4, f. *featheri*.





Some female specimens of this very variable species incline very strongly to a red-brown with no greenish tint and the sub-marginal lunules are well developed and bluish-white, thus bearing a very strong resemblance to *E. eleus*, *Hypolimnas missipus* female and *Danaïda chrysippus*. To this form we give the name *E. paradoxa* f. nov.

RUFESCENS. Pl. XIX, figs. 1—4. Pl. XX, fig. 1.

The type specimen and many others show very strongly on both surfaces of the fore-wing, the two distal black spots in the cell. On the under surface the whitish markings are more sharply defined and distinct than in the male type or female allotype; the sub-marginal white spots are as in the allotype.

In some specimens there is a distinct white sub-costal stripe on the under-surface of the hind-wing between veins 7 and 8; an extension to the margin of the wing of the basal white mark on the sub-costal nerve which is present in most specimens. This white stripe increases the likeness to *eleus* produced by the red colouration and pale sub-marginal hind-wing spots. Type, female, Suna, South Kavirondo, Kenya Colony, April, 1932. In Hope Dept., Oxford University Museum. A series of 20 in Coll. van Someren.

As with other *Euphaedra*, there is a very distinctive female form the general ground colour of which is a pale bluish-green. The following description is submitted by Prof. Hale Carpenter.

*E. paradoxa* f. nov. VANSOMERENI. Pl. XXI, figs. 1—4.

The pattern is as in *paradoxa paradoxa*, but the pale areas are of that peculiar pale bluish-green so hard to describe. The sub-apical bar is very pure white; the type specimen has well developed sub-marginal lunular markings on the hind-wing, while some show them more faintly. The two distal spots in the cell of the fore-wing, not shown on the underside, are indicated on the upperside as large and blurred. The pale area on the underside of the hind-wing is conspicuous. The upper surface, as with the male form *preussoides*, is extraordinarily like the corresponding sex of *preussi preussi*, but the lack of the costal stripe on the hind-wing, the presence of the large pale discal patch, and the absence of the black spots on the underside, distinguish *paradoxa vansomereni* from *preussi*. It also bears a strong resemblance to a pale form of *uganda*.

Type, female, Suna, South Kavirondo, April, 1932. In Hope Dept., Oxford University Museum. Dr. van Someren. Paratypes in Coll. van Someren. 12 specimens.

It is possible that when the much needed revision of the genus *Euphaedra* is undertaken, *paradoxa* may prove to be a race of *uganda*, or *preussi*; decision must await anatomical investigation.

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I now propose to describe other forms of this variable species.

*E. paradoxa* f. nov. COMIXTA. Pl. XXII, figs. 1—4.

A male form which presents the following characters: Almost the entire fore-wing greenish-black rather darker at the proximal border of the sub-apical band. The fore-wing pale areas greenish-golden and limited to the distal end of 1a and 1b, but not reaching to the hind angle. The base of the wing is thus suffused with dark green. The spots in the cell are seen but clouded by the general green scaling. The hind-wing base is greenish; the discal area greenish-golden; the marginal border dark green without any indication of sub-marginal spots, but there are darker green angular marks in the margin, base toward edge. The under-surface is as in the form *preussoides*.

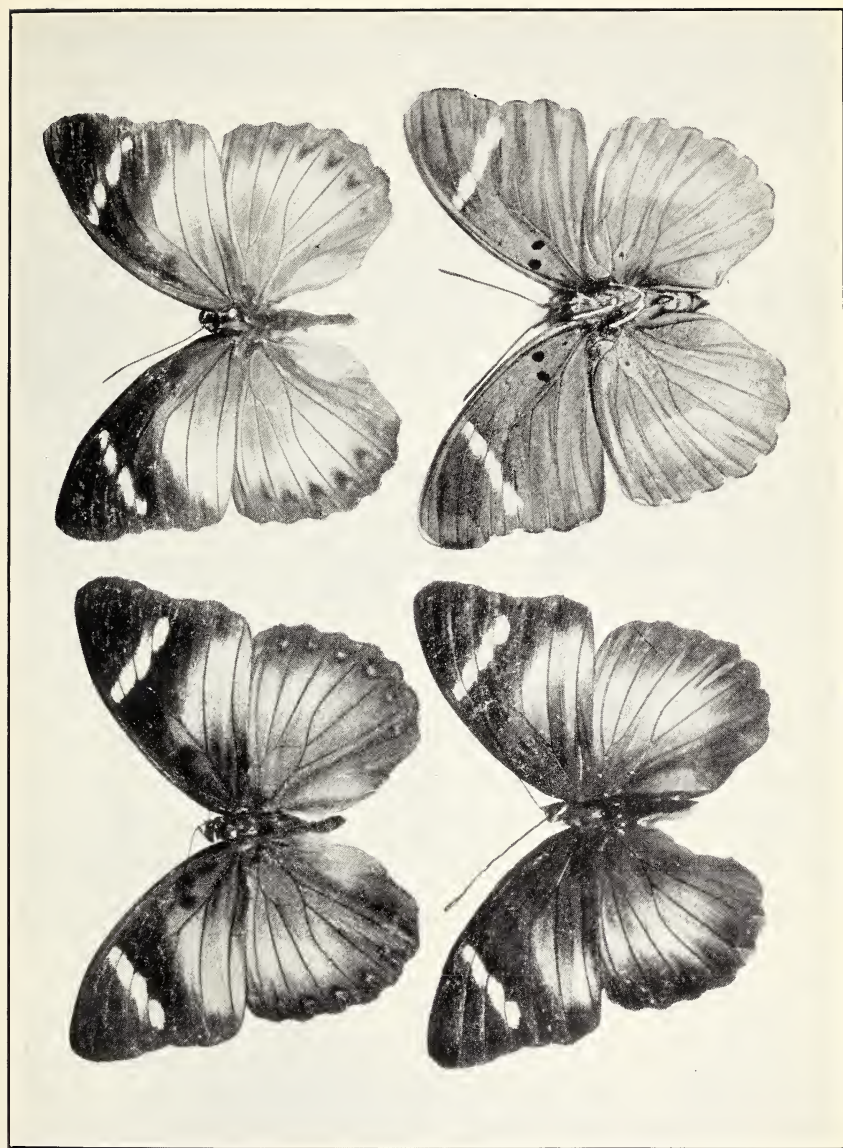
Type, male, Suna, South Kavirondo, Dr. van Someren leg., April, 1932, in Coll. van Someren. Paratypes, nine, in my collection. This form links the typical *paradoxa* with the form *preussoides*.

*E. paradoxa* f. nov. FEATHERI. Pl. XXIV, figs. 1—4.  
Pl. XX, figs. 2—4.

This is a female form represented by a long series, 14 examples in my collection. They differ from the female allotype of *paradoxa* by the greater degree of black of the fore-wing which covers the cell as a clouding of blackish, thus obscuring the two large spots in the cell, and also covers the basal portion of the wing. The pale areas are thus restricted to the mid portion of areas 1a, 1b, and the base of 3 but it is of a bright bluish-green with orange scaling in 2 and bluish distally. The hind-wing basal area is greenish-orange dusted with blackish scales, but the distal portion is orange and clear-cut corresponding to the white band of the underside. The marginal border is black with bluish lunules proximally edged with stronger black; indentation on the wing margin is strongly white.

Type, female, Suna, South Kavirondo. van Someren. In my collection.

This form is dedicated to my late friend, W. Feather, who helped me to obtain my material, and who did so much to increase our knowledge of African Lepidoptera.



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*Euphaedra paradoxa* f. *vansomeri*.  
Figs. 1-3, upper surface. Fig. 4, under surface.





PLATE XXII.



*Euphaedra paradoxa* f. *comixta*, ♂ ♂.



PLATE XXIII.



*Euphaedra paradoxa*, ♂♂, showing variation on the underside.







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Other individual variations not represented in series are as follows:

- (a) Males similar to nominate *paradoxa* but with dark areas black with little or no greenish tinge, and fore-wing bar white.
- (b) Males in which the whole of the fore-wing is greenish black except for a white sub-apical band, and the hind-wing all dark green except for a small diffuse patch of gold just beyond the middle.
- (c) Males in which the fore-wing dark areas are dark green with greenish-white sub-apical band. H.-w. border green with scarcely a trace of sub-marginal spots.
- (d) Similar to (c) but fore-wing band yellow.
- (e) Very similar to (c) but with fore-wing band almost absent and the basal area of the hind-wing strongly green. Vide Pls. XVI and XVII.

The chief variations are thus in the colour and width of the fore-wing bar or band; the degree of greenish scaling and its extent. On the underside, the presence or absence of a sub-costal white streak on the hind-wing; the size and number of the cell spots; the width of the white bar beyond the middle and the ground-colour variation from green to golden olive to rusty. Variations in the various female forms are due, apart from the ground colour, to the extent of the black of the apical half. In many, this colour extends through the cell, thus obscuring the cell spots and reaching the base; the width and colour of hind-wing marginal border and size and colour of sub-marginal spots; and the width of the fore-wing bar.

Most of these variations are depicted in the accompanying plates.

#### EARLY STAGES:

Though common in its area of distribution, this species has not been bred.

#### DISTRIBUTION:

So far as is known, this species is limited to the patches of forest in the South Kavirondo area, and to the Lolgorien district. One odd specimen taken in 7/5/13 was from the Chepalunga Forest.

#### *EUPHAEDRA ELEUS ALTERNUS*, *nom. nov.* for.

= *Euphaedra eleus latifasciata*, Talbot.\*

Pl. XXV, figs. 1—4. Pl. XXVI, figs. 1—4. Pl. XXVII, figs. 1—4.

Talbot, *Trans. Ent. Soc.*, Dec., 1929.

Type as given *op. cit.*

Expanse: Male, 70-85 mm. Female, 95-110 mm. Sexes much alike, orange-red with black borders carrying white marks.

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\* The name *latifasciata* is preoccupied by *latifasciata*, Holland.

#### MALE :

F.-w. : Basal half red-brown to orange-brown, extending from the base to the apex of the cell, thence to the root of vein 3 and posteriorly to the sub-margin of the hind-angle; the costa is greenish for its most part; apical half of the wing black or green-black with a sub-apical bar of four white or yellowish-white spots, the third one longest, the fourth small and set distal to the third. A double bluish spot is sometimes present sub-marginal at the hind angle. Cell with two, one, or no black spots.

H.-w. : Orange to red-brown; black at extreme base below costa; veins black-scaled; marginal border black carrying a sub-marginal series of pale spots, seven in number of almost equal size, either white, or bluish sometimes accentuated proximally with deeper black than the ground. Margin strongly scalloped with white in indentations. Body with four white spots on front of thorax and two on the sides; abdomen white lined.

#### UNDERSIDE :

F.-w. : Rufescent to rusty, slightly darker towards apex, sometimes green-tinged, sometimes with a purply tinge; cell with one, two, or three, or no black spots, sometimes one at apex; sub-apical band white; often a double spot at hind angle.

H.-w. : Ground colour as fore; a well-marked sub-costal white streak extending from base to first submarginal white spot; a series of sub-marginal white spots in position as above, often accentuated proximally with black border; just beyond the mid-line a series of whitish marks varying in size from definite streaks to mere spots. Margin with white in indentations.

#### FEMALE :

General pattern as in the male; ground colour usually paler and more orange; fore-wing sub-apical band broader and white. Dark areas of fore and hind-wing black with occasionally a blue tinge; hind-marginal spots white, white tinged with blue or pale blue, the lower ones slightly larger.

#### UNDERSIDE :

As in the male but ground colour paler. Some specimens with a whitish " flare " at base of fore-wing.

#### EARLY STAGES :

I have not bred the species.

#### DISTRIBUTION AND HABITS :

These *Euphaedra* bear a strong resemblance to certain diurnal moths with which they form a mimetic association.





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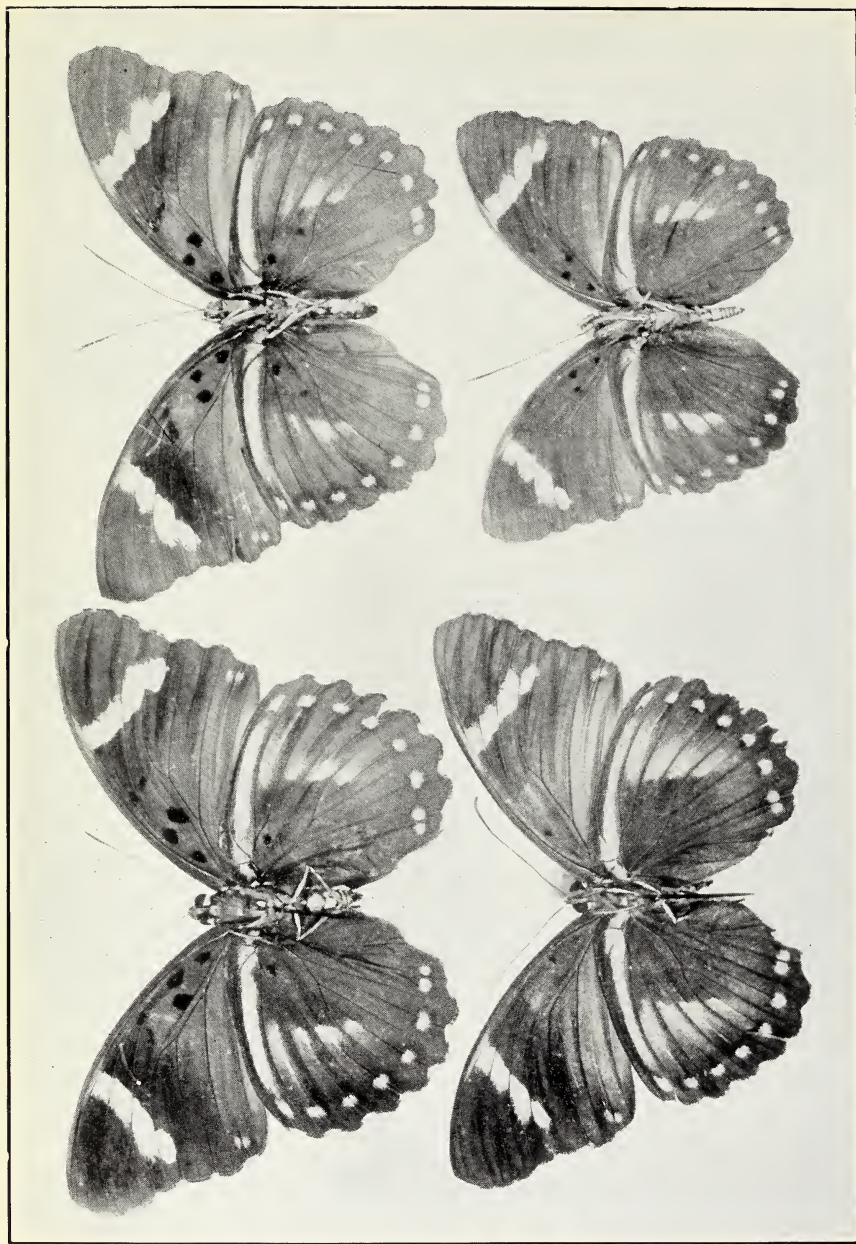
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*Euphaedra eleus alternus*.  
Figs. 1 and 4, ♀ ♀. Fig. 2, ♀. Fig. 3, ♂. Fig. 4, ♂.







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*Euphaedra eleus alternus*.  
 Fig. 2. Underside of ♀.  
 Fig. 3. Underside of ♀.  
 Fig. 4. Underside of ♂.







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*Euphaedra eleus alternus*.  
Fig. 1, ♂ f. *rufobrunneus*. Fig. 2, ♀ underside.  
Fig. 3, ♀ f. *ratrayi*. Fig. 4, ♂ underside.

In forested areas throughout Uganda eastward to Elgon and Kavirondō to Nandi. The general habits are very similar to other *Euphaedra* but on the whole they are more given to frequenting the more open parts of the forest, not seeking dense shade to any great extent. The form *ORIENTALIS*, Roths., occurs at the coast of Kenya on the Rabai Hills.

I now propose to deal with the various forms which have been given names.

*E. eleus* f. *rattrayi*, E. Sharpe. Pl. XXVII, fig. 3. Pl. XXVI, fig. 2.

Differs from the nominate form in having the light areas of the fore-wing suffused with greenish, particularly distally but retaining some rufescent scaling at the base; the costal area of the hind-wing also green-scaled.

This form should be referred to as merely an aberration, and is rare. The specimen figured is in the collection of my friend T. H. E. Jackson, and was taken at Kakamega.

Form *coprates*, Druce. Pl. XXV, fig. 3.

Differs from the nominate form in having the dark areas of the fore and hind-wings strongly tinged with green, that of the fore-wing not extending into the cell which has two black dots, nor does it extend beyond the root of vein 3.

Form *rufobrunneus*, Stoneham. Pl. XXVII, fig. 1.

Diverges from the nominate form in having the brown areas very dark mahogany, with an extension of the fore-wing black into the cell and also basally thus obscuring the cell spots. The underside is very dark and tinged with green. This is merely an individual aberration.

Form *orientalis*, Roths.

Differs from the nominate form in having a broader white sub-apical bar. The dark areas of the f.-w. extending to vein 3. Coast.

For the other varietal names applied by Stoneham, I would refer to Bull. Stoneham Museum, No. 10, June, 1932. The name recognised above, is the only one I am prepared to support; the remainder are hardly worth separation under different names as the characters are small and unstable. In the descriptions no mention is made of the sex of the "type," an important point.

Furthermore, Talbot described the Uganda-Kenya race of *eleus*, and though the colour of the spots in the hind-marginal border is not mentioned, one of Stoneham's names might be a synonym, as Talbot's description has priority.

I have, however, made a careful examination of Talbot's description and type and compared it with the various forms named by Stoneham: as none of these apply, a substitute name for Talbot's *latifasciata* is here given.

*EUPHAEDRA CROCKERI CAERULESCENS*, Gr.-Sm.

This species is mentioned on the evidence of one specimen in the British Museum, labelled Karubi Forest, Nairobi.

Seitz, in *Macrolepidoptera of the World*, Vol. XIII, p. 185, gives this as a form of *xypete*. It is figured as *gausape*, pl. 44a. I suggest that the species does not occur in Kenya and the label on the specimen is an error.

*EUPHAEDRA SARITA INANOIDES*, Holl.

Pl. XXVIIIa, fig. 4. Pl. XXVIIIb, fig. 2.

Expanse, male, 75 mm.

MALE:

F.-w.: With a green-blue area covering most of 1a and the basal two-thirds of 1b, this same colour covering the apical portion of the wing from the apex of the cell, toward the tip and outer margin; this area traversed by an indistinct sub-apical whitish band; cell and the remainder of the wing, blue-black; two black cell spots indicated.

H.-w.: Basal area blackish, disc of wing light-bluish-green; marginal border blue-black, and at its junction with the pale area a series of faintly indicated bluish spots margined inwardly with black.

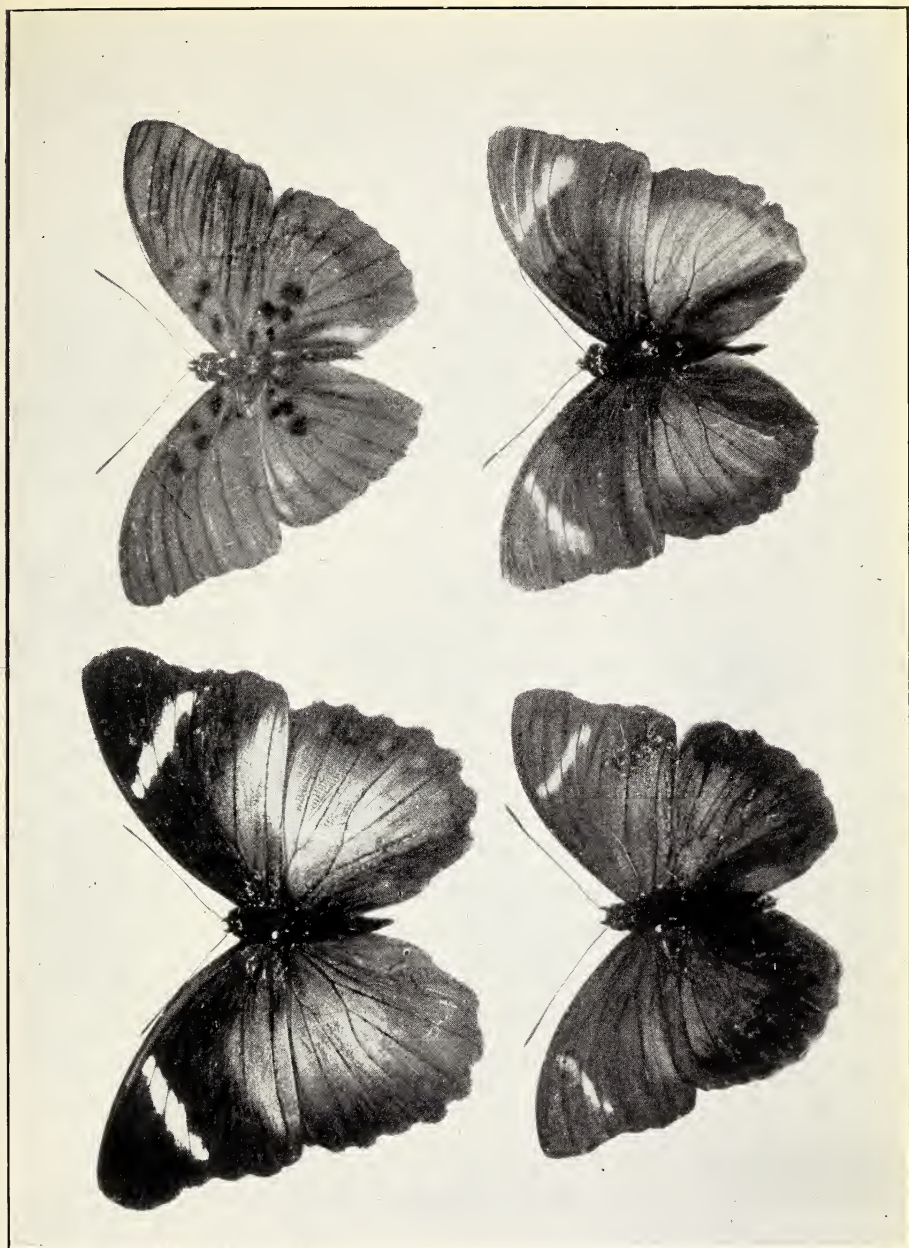
UNDERSIDE:

F.-w.: Greenish-grey with an ochreous tint; cell with three black spots; sub-apical band white. H.-w.: Ground colour as fore-wing more golden tinted along inner margin; cell with one small black spot; sub-marginal spots faintly indicated as also a whitish band beyond the middle.

A variety of the male, from Uganda, is as follows:

F.-w.: Blue black with a bluish sheen at the base; a blue patch along the hind margin; costa blue; sub-apical bar slightly clubbed bluish to white below costa; extreme apex white; small white dots at mid-internervular point on fringe. H.-w.: Ground colour black with a large blue patch, the blue sheen extending toward the base. Fringe with distinct white spots. Underside: Greyish-olive suffused with golden along the inner fold of the h.-w. F.-w. cell with three black spots; apex of cell with two black dots; area corresponding to the sub-apical bar of above, whitish. H.-w. cell with one black spot toward upper side and one toward apex; a slight whitish "flare" on disc, and slight whitish sub-marginal spots; fringe black with white dots at mid-internervular points. (Jackson Coll.)





Figs. 1 and 2. *Euphaedra eberti*, ♀ and ♂.  
 Fig. 3. *Euphaedra edwardsi*, ♂.  
 Fig. 4. *Euphaedra sarita inaeoides*, ♂.



PLATE XXVIIIb.

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*Euphaedra sarita inanoides*, ♂.  
Upper and undersurfaces.







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Fig. 1. *Euphaedra edwardsi*, ♀.  
Fig. 2. *Euphaedra sarita inanoides*, ♀.

The female is not represented in my collection, and descriptions are incomplete; a figure is given on Pl. XXVIIIc. The characteristic "clubbed" end of the sub-apical bar is well shown.

EARLY STAGES:

I can find no record of these.

DISTRIBUTION:

This species ranges from the Congo into Uganda along the Semliki at Dwamba Forest and Mpanga. It is strictly a western species. The specimens figured were taken by Prof. Carpenter, and T. H. E. Jackson.

*EUPHAEDRA EBERTI*, Auriv. Pl. XXVIIIa., fig. 2.

Expanse: 75-80 mm. in male.

MALE:

F.-w.: Very similar to *sarita inanoides*, the green colour being distributed over the basal half of the wing and again beyond the cell toward the outer margin and the apex, this greenish area traversed by the whitish-green sub-apical band. The distal portion of the cell, an area across the wing and the wing-margin blackish; two large obscured black spots in the cell. H.-w.: Almost entirely blue-green slightly dusted with blackish at the base; marginal border black with obscure black and bluish spots.

UNDERSIDE:

Matt greenish-grey; cell with three black spots, the base of the cell golden; sub-apical band white. H.-w.: Ground colour as fore-wing, base of costa brick to orange-red; one black spot in cell; practically no white band beyond middle, and sub-marginal spots very indistinct.

Early stages unknown.

DISTRIBUTION:

Within the Uganda Protectorate, this species ranges from the Congo into the Semliki at Dwamba Forest, Toro.

*EUPHAEDRA EDWARDSI*, Hoeven.

Pl. XXVIIIa, fig. 3.

Pl. XXVIIIc, fig. 1.

F.-w.: Ground colour dark olive green; a large black spot at base of Ib; three large black spots in cell, often two at apex of cell. H.-w.: Marginal border green with paler areas triangular centrally; disc of wing orange-brown; a large black discocellular spot in 4; two large and one small spot in the cell.

UNDERSIDE :

F.-w. : Greyish over apical half, greenish basally; cell with three large black spots; base of wing with slight orange tinge. H.-w. : Base of costa and marginal border greenish-grey, disc greyish-orange; three black spots in cell; two at base of costa, one in 4 and one in 7; a white sub-costal streak with black base present.

*E. edwardsi viridis*, Suffert.

This has the basal area of the hind-wing dusky green and the cell spots are small or indistinct.

Early stages unknown.

DISTRIBUTION :

Dwamba Valley, Toro, Daro Forest and Tero Forest, taken by Neave and Carpenter. A Congo species which has a limited extension into Uganda.

*EUPAEDRA RUSPINA*, Hew. Pl. XXIX, figs. 1—4.

Expanse: Male 70-90 mm. Female 90-105 mm. Sexes alike.

MALE :

F.-w. : General colour orange-brown; apical portion black, with this colour extending along the costa to almost the base but all along the costal edge, and as a narrow line along the outer margin; a sub-apical interrupted bar of three white spots, the upper one small and often indicated by a few white scales. Small white marks on margin of outer edge.

H.-w. of the same ground as fore-wing with a slightly richer tint distal to the cell; marginal border black, narrow at outer angle and expanding to the anal angle which has an angular projection; margin white at indentations.

UNDERSIDE :

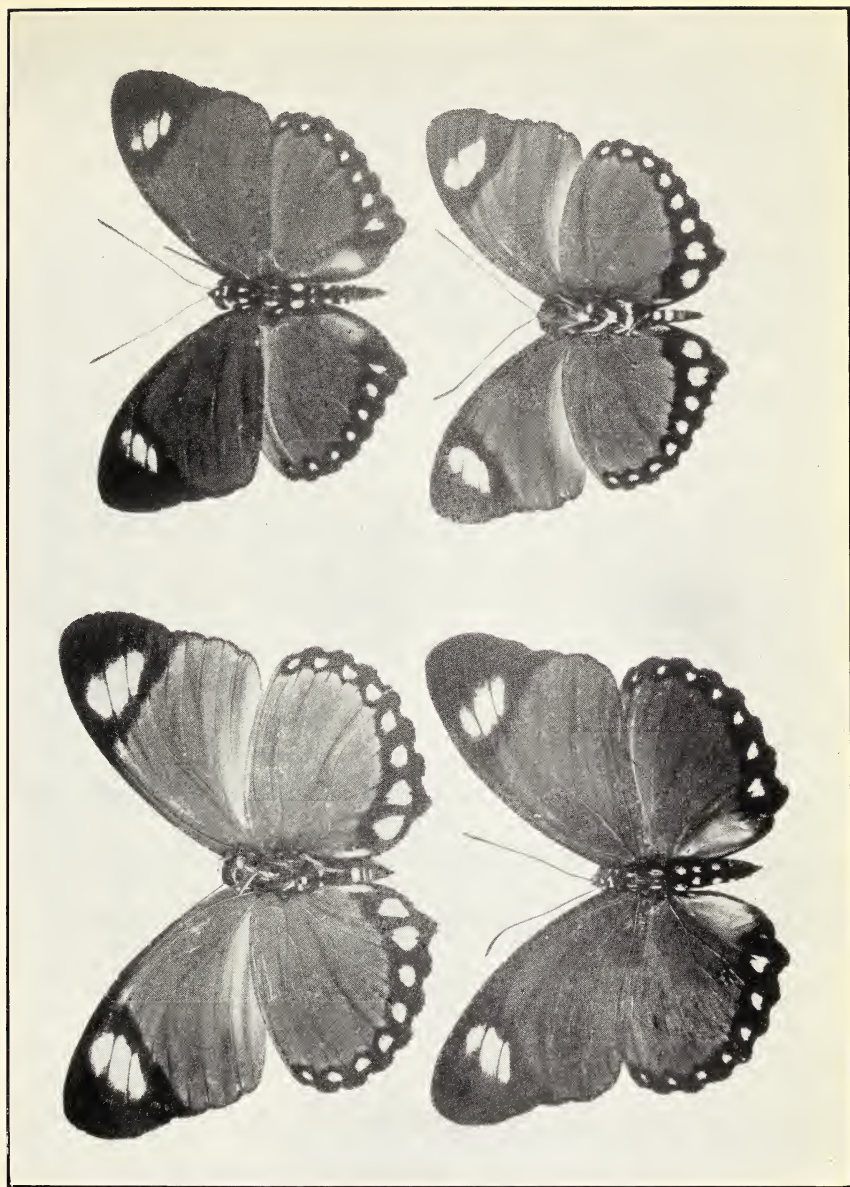
Pattern as above, more or less; sub-apical bar wider and general colour paler, while the dark apex of the fore-wing is tinged with greenish. Eight white spots on marginal border, and one on anal fold.

FEMALE :

Very like the male, but often paler and white spots larger. The anal angle is not produced, to a point. The thorax has four white spots at front and two along the sides; abdomen white lined and spotted.

Early stages unknown to me.





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*Euphaedra ruspina*. Figs. 1 and 2, ♀ ♀. Figs. 3 and 4, ♂ ♂.







*Euphaedra eusemoides imitans*, ♀ and ♂.







*Euphaedra xypete cyanea*, ♂ and ♀.

#### DISTRIBUTION :

In forested areas of western to eastern Uganda. In general habits it resembles other *Euphaedra*, but its flight is more swift and gliding, each glide being longer sustained. It is associated in flight with the diurnal moth *Aletis helcita*, and certain members of the genus *Xanthosiplopteryx* which it mimics.

#### *EUPHAEDRA EUSEMOIDES IMITANS*, Holl.

Pl. XXX, figs. 1 and 2.

F.-w. : Ground colour black, apex white-tipped and white fringe spots. Sub-apical bar cream, consisting of two contiguous spots distal to the apex of the cell, and one larger, more rounded spot toward margin and more toward the apex; a cream transverse bar crosses the cell followed by a pear-shaped spot toward the base of area two. A creamy streak along the hind-margin but not reaching the hind angle. H.-w. with the greater part orange-red, dusky at base and with a black border and white marks in the fringe; three black spots in the cell.

In the female, the creamy streak along the hind-margin of the fore-wing is more marked; the red area in the hind-wing greater in extent and there is a submarginal row of double whitish to bluish spots. The black spots in the h.-w. cell are only indicated and not defined.

Early stages unknown.

The specimens figured are in the British Museum. I am indebted to the Museum authorities for this plate, also that of *E. cyanea*.

#### DISTRIBUTION :

Forests to the western side of Uganda; Daro and Budongo.

#### *EUPHAEDRA XYPETE CYANEA*, Holland. Pl. XXXI, figs. 1 and 2.

Related to *coerulescens*, Gr.-Sm.

" F.-w. : The basal area is bright blue from the base to the middle of the cell and thence outwardly to nearly the inner angle of the wing. Beyond this bright blue area, the outline of which is quite straight, the remainder of the wing is rich velvety black, interrupted, however, by a sharply defined post-apical band of bright blue, which is much more sharply defined than is the case in *coerulescens* and does not extend as far downward toward the inner margin . . . "

" The middle of the upper side of the hind-wings . . . is bright blue . . . " " On the underside . . . the cell is green or greenish ochraceous." " The dark spots in *E. cyanea* which appear in the cell of the fore-wing are . . . small . . . " " The spots in the cell of the secondaries are also very greatly reduced or disappear and the discal spots beyond the cell . . . are smaller and the red

of the costal border in some specimens spreads downward into the discal area of the wing as a faint reddish shade."

"The females in *cyanea* are marked exactly as are the males but have much greater expanse of wing, and the post-apical band of the primaries on the upper side is paler blue."

Extracted from the original description, *Bull. Am. Mus.*, Vol. XLIII, pp. 178-9.

The specimens figured are in the British Museum and I am indebted to this Institution for the photograph.

DISTRIBUTION:

Forests of Western Uganda.

*EUPHAEDRA ZADDACHI*. Sharpe. Pl. XXXII, figs. 1 and 2.

F.-w.: Velvety black with a green sheen at the base; sub-apical bar creamy, slightly clubbed at marginal end; a second bar crosses the mid portion of the wing from the apex of the cell through the base of 2 and thence into 1b. H.-w.: Base and marginal border black, no sub-marginal spots but white fringe along the extreme edge at internervular spaces; central area yellowish-red, the veins creamy yellow.

UNDERSIDE:

F.-w.: Cell creamy with greenish tinge, three black spots; hind marginal area blackish; the second creamy bar of above present below and outlined with black; beyond this bar the colour is olive tinged with pink and two large arrow-shaped blackish marks are present distally; the sub-apical bar is creamy edged below with black; a series of broken sub-marginal black marks extend almost to the apex, while the outer edge is black with small white spots in fringe; apical portion of wing olive white-tipped. H.-w.: Cell with three black spots; ground colour pinkish-red, strongest along the sub-costal area, and suffused with ochreous along inner border; a creamy patch is present at distal part of cell, and a larger patch of the same colour sub-basal in 2-6 with black marks in 5, 6, and 7. A sub-marginal row of double black spots in each internervular space from outer angle to anal angle followed by an area of olive tawny, becoming more green toward the anal angle, outlined on the edge with black carrying white spots on the fringe at mid-point of marginal scalloping.

*E. z. f. CHRISTYI*, Sharpe. Pl. XXXIIa, figs. 3 and 4.

Pl. XXXIIb, figs. 1 and 2.

F.-w.: Similar to the above; h.-w. differs in having the patch creamy with a slight greenish tinge basally, and the black marks of the



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Figs. 3 and 4. *E. z. christyi*, ♂ ♂.

Figs. 1 and 2. *Euphaedra zaddachi zaddachi*, ♂ ♂.







*Euphaedra zaddachi christyi*, ♂ and ♀.



underside showing through. Underside: F.-w. as in the above form but lacking the pinkish tinge between the creamy bars. H.-w.: Ground colour creamy with greenish tinge and pinkish-red limited to the sub-costal area.

#### DISTRIBUTION AND HABITS:

This species is found in the forests of western Uganda and extends east as far as Kampala area. They bear a remarkable resemblance to certain day-flying distasteful moths such as *Xanthospilopteryx superba*, *poggei* and *atribasalis*, also the Hypsid moth *similis*. The black and white females resemble *X. gruenergi* and somewhat, *Amauris niavius* and its associates. There is an undoubted mimetic association between these insects.

DESCRIPTIONS D'EUCNEMIDIDAE ET ELATERIDAE  
NOUVEAUX PROVENANT DU CORYNDON MEMORIAL  
MUSEUM DE NAIROBI, KENYA COLONY.

PAR E. FLEUTIAUX,

*Correspondent du Muséum National d'Histoire Naturelle de Paris.*

EUCNEMIDIDAE.

PLESIOFORNAX, Bonvouloir, 1866.

Génotype: *P. gravis*, Bonvouloir.

*P. TURNERI*, n. sp.

11 mm. 1/2. Allongé, étroit; brun, un peu plus clair que les élytres; pubescence jaune. Tête convexe; ponctuation assez grosse, peu profonde, ombiliquée, serrée et rugueuse, carène interoculaire interrompue sur la base de l'épistome; épistome aussi large en arrière que l'espace susantennaire. Antennes brunes, dépassant la moitié du corps, minces, filiformes; 2e article très petit; suivants longs et graduellement allongés. Pronotum aussi long que large à la base; légèrement arqué sur les côtés, graduellement rétréci en avant, convexe, aplati en arrière, ponctué comme la tête; angles postérieurs aigus, non carénés. Elytres longs, parallèles jusqu'à la moitié, rétrécis au delà, conjointement arrondis au sommet, finement et densément ponctués, légèrement striés. Dessous de même couleur, finement ponctué, surtout sur l'abdomen. Hanches postérieures très larges en dedans, fortement rétrécies et presque nulles en dehors. Pattes testacées.

Kaimosi (A. Turner). Muséum, Paris.

Ressemble beaucoup à *P. borealis*, Fleutiaux; plus étroit; ponctuation plus grosse, plus serrée, ombiliquée, rugueuse.

ELATERIDAE.

AGRYPNUS, Eschscholtz, 1829.

Génotype: *Elater tomentosus*, Fabricius.

*A. ACUMINATUS*, n. sp.

30 mm. Allongé, très atténué en arrière; noir presque opaque; pubescence nulle. Tête plate, déprimée au milieu en avant; ponctuation forte et peu serrée. Antennes noires, tout à fait mates à partir du 4e article, dépassant notablement la base du pronotum, graduelle-

ment rétrécies vers le bout; 2e et 3e articles petits; suivants comprimés et serriformes. Pronotum à peine plus long que large, sinué sur les côtés, légèrement rétréci en avant, peu convexe; base assez brusquement déclive, avec un tubercule obtus au milieu; ponctuation très grosse en avant, beaucoup plus fine en arrière; angles postérieurs aigus, divergents, carénés près du bord latéral jusqu'au delà de la moitié. Elytres légèrement plus larges que le pronotum à la base, arrondis aux épaules, fortement atténués en arrière, conjointement arrondis au sommet, convexes; ponctuation des stries bien marquée à la base, très légèrement sur le dos, fortement sur les côtés. Dessous noir; pubescence rousse très légère. Propectus fortement ponctué sauf en avant du prosternum. Pointe prosternale légèrement creusée en gouttière. Arrière-corps finement et densément ponctué. Pattes noires; pubescence en brosse sous les tarses.

Thua River, novembre (MacArthur). Muséum, Paris.

Ressemble beaucoup à *A. infuscatus*, Klug; en diffère par la taille notablement plus grande; par la ponctuation du pronotum beaucoup plus grosse en avant et très fine en arrière; par les stries des élytres très légèrement ponctuées sur le dos.

LACON, Castelnau, 1836.

*Adelocera*, Latreille, 1834 (non Latreille, 1829).

Génotype: *Elater fasciatus*, Linné.

*L. MACARTHURI*, n. sp.

6 mm. 1/2. Oblong; noir opaque, un peu rougeâtre aux angles postérieurs du pronotum; pubescence grise et brune, peu serrée, plus courte sur les élytres. Tête plate, criblée de gros points. Antennes testacées, légèrement serriformes à partir du 4e article; 2e et 3e articles petits. Pronotum plus long que large, graduellement rétréci en avant, convexe, criblé de gros points; angles postérieurs plats, aigus, non divergents, non carénés. Elytres plus larges que le pronotum, arqués sur les côtés, convexes, fortement striés de rangées rapprochées de gros points. Dessous noir, fortement ponctué; pubescence brune, courte, peu serrée. Sutures prosternales largement sillonnées jusqu'à la base. Propleures légèrement impressionnés près de la suture. Epipleures des élytres subparallèles, tronqués carrément en arrière. Episternes métathoraciques plus étroits et parallèles. Hanches postérieures élargies en dedans, pas plus larges en dehors que les épisternes. Pattes testacées.

Hola, Tana River, novembre (MacArthur). Muséum, Paris.

Ressemble à *L. Alluaudi*, Fleutiaux; forme plus courte; élytres plus largement ovales; ponctuation du pronotum moins serrée; celle des

élytres de même grosseur sur toutes les rangées et rugueuse; alors que chez *Alluaudi*, les rangées de gros points sont alternées avec des rangées de points moins gros et la surface non rugueuse.

*BRACHYLACON*, Motschulsky, 1858.

Génotype: *B. microcephalus*, Motschulsky.

*B. TESTACEUS*, n. sp.

4 1/2 à 4 mm. 3/4. Oblong; testacé, un peu obscur sur les élytres; pubescence grise assez longue, peu serrée. Tête carrée, plate, sillonnée au milieu, fortement ponctuée. Antennes testacé clair, serriformes; 2e article petit; 3e presque aussi long que le suivant, mais moins large. Pronotum aussi long que large, très sinué sur les côtés, rétréci en avant près des angles antérieurs, peu convexe, déprimé en arrière; ponctuation grosse et peu serrée; angles postérieurs plats, aigus, non divergents, non carénés. Elytres parallèles à la base, légèrement arqués dès avant la moitié, conjointement arrondis au sommet, convexes, unis, striés de rangées de gros points alternant avec des rangées de points moins gros. Dessous testacé, fortement ponctué. Prosternum saillant en arrière; sutures prosternales sinueuses, largement ouvertes presque jusqu'aux hanches antérieures, sillons dorsaux des propleures rapprochés des sutures prosternales, droits profonds, n'atteignant pas le bord en avant. Sillons tarsaux du métasternum obliques, dirigés un peu en dessus des hanches postérieures. Epipleures des élytres larges, rétrécis en arrière, tronqués carrément postérieurement. Episternes métathoraciques étroits, nuls en arrière. Hanches postérieures très étroites en dehors, élargies en dedans. Pattes testacé clair.

Ziwani, avril (MacArthur). Collection Fleutiaux et Coryndon Memorial Museum, Nairobi, Kenya Colony; Thua River, novembre (MacArthur). Idem.

Diffère du génotype par sa forme oblongue beaucoup plus étroite.

*ADELOCERA*, Latreille, 1829.

*Lacon* des auteurs.

Génotype: *Elater ovalis*, Germar.

*A. KINANGOPA*, n. sp.

6 3/4 à 7 mm. Court, ovale, subdéprimé; brun noirâtre, un peu rougeâtre sur la suture des élytres et parfois aux angles postérieurs du pronotum; pubescence squamiforme brune, courte et peu serrée. Tête plate; ponctuation grosse. Antennes testacées, brunes à la base; 2e et 3e articles petits, suivants plus longs et légèrement dentés. Pronotum aussi long que large à la base, parallèle, arrondi en avant, peu



convexe déprimé en arrière; ponctuation grosse et peu serrée; angles postérieurs plats, non divergents, non carénés. Elytres courts, parallèles à la base, arrondis en arrière, peu convexes, striés de gros points; interstries plans, très finement et espacement pointillés. Dessous de même couleur; pubescence semblable. Pattes ferrugineuses.

Kinangop, mars (Turner). Collection Fleutiaux et Coryndon Memorial Museum, Nairobi, Kenya Colony.

Diffère de *A. foeda*, Candèze; plus court; plus brillant; ponctuation du pronotum moins serrée; interstries des élytres plus finement ponctués.

### *TYLOTARSUS*, Germar, 1840.

Génotype: *T. cinctipes*, Germar.

Sous-genre *Lobitarsus*, Schwarz (*L. decoratus*, Schwarz).

#### *T. TECTUS*, n. sp.

11 mm. Oblong, subdéprimé; noir; pubescence squamiforme grise et brune cachant la surface. Tête plate; ponctuation grosse et serrée. Antennes brunes, noirâtres à la base. Pronotum à peu près aussi large que long, parallèle, arrondi en avant, convexe, assez brusquement déprimé à la base; ponctuation grosse et assez serrée; angles postérieurs plats, aigus, non divergents, non carénés. Elytres parallèles, arrondis au delà de la moitié, peu convexes, striés de rangées rapprochées de gros points masqués par des squamules. Dessous et pattes couverts de la même pubescence squamiforme. Sillons tarsaux des propleures presque en travers, non nettement limités. Sillons tarsaux du métasternum aboutissant avant l'angle postérieur externe.

Lower Tana-Sabaki, avril-mai (Turner et MacArthur). Collection Fleutiaux et Coryndon Memorial Museum, Nairobi, Kenya Colony.

Ressemble à *T. marmoratus*, Candèze, mais plus court, plus large; squamules plus grosses, grises et brunes.

#### *T. LUCTUS*, n. sp.

8 mm. 1/2. Allongé; noir opaque, brun rougeâtre aux angles postérieurs du pronotum et aux épaules; squamules brunes mélangées de squamules grises formant des taches très petites sur toute la surface. Tête plate fortement ponctuée. Antennes noires, courtes, moniliformes, très légèrement dentées. Pronotum légèrement plus long que large, subparallèle, faiblement rétréci en avant, convexe, déprimé en arrière, fortement et densément ponctué; bords latéraux crénelés; angles postérieurs droits, plats, non carénés. Elytres parallèles à la base, arqués sur les côtés, arrondis au sommet, convexes,

fortement ponctués-striés, avec une rangée de points moins gros sur les interstries. Dessous noir, densément et fortement ponctué; squamules grises plus nombreuses. Pattes brunes.

Lower Tana-Sabaki, avril-mai (Turner et MacArthur). Muséum, Paris.

Voisin de *T. obscurus*; pronotum plus arrondi en avant, angles postérieurs non divergents; élytres pas plus larges que le pronotum.

#### *T. OBSCURUS*, n. sp.

9 mm. Allongé; noir, piqué de squamules brunes mélangées de quelques squamules grises. Tête déprimée au milieu, fortement ponctuée. Antennes serriformes à articles courts, testacées, brunes à la base; 2e et 3e articles petits. Pronotum à peu près aussi large que long, sinué latéralement, rétréci en avant seulement près des angles antérieurs, convexe, déprimé à la base, fortement et densément ponctué; angles postérieurs plats, divergents, obtus, non carénés. Elytres plus larges que le pronotum, légèrement arqués sur les côtés, graduellement rétrécis en arrière, rugueusement et fortement ponctués-striés. Dessous noir, fortement et densément ponctué. Sillons tarsaux peu profonds sur les propleures, nuls sur le métasternum. Pattes noires; tarses testacés.

Kilimafeza, février (MacArthur). Muséum, Paris; S. Masai Res., novembre (T. J. Anderson). Imperial Institute of Entomology, London.

Voisin de *T. samburensis*, Fleutiaux (sub *Lacon*); moins long, moins parallèle, squamules obscures; ponctuation plus grosse, rugueuse sur les élytres; bords latéraux du pronotum très faiblement crénelés.

#### *HEMICLEUS*, Candèze, 1857.

Génotype: *H. caffer*, Candèze.

#### *H. ELEGANS*, n. sp.

4 mm. Allongé; noir avec des taches testacées aux angles postérieurs du pronotum et sur les élytres, aux épaules, sur la suture, transversalement au dernier tiers et à l'extrémité; pubescence squamiforme brune et grise mélangée. Tête plate, arrondie en avant, légèrement impressionnée au milieu; ponctuation peu serrée. Antennes assez longues, grêles, noires, les deux premiers articles testacés; 3e de même forme et presque aussi long que le suivant. Pronotum plus long que large gracieusement arrondi sur les côtés, à peu près également rétréci en avant et en arrière, convexe sur le dos; ponctué comme la tête, moins densément au milieu; angles postérieurs aplatis. Elytres légèrement plus larges à la base que le pronotum, assez longs, légèrement arqués latéralement, convexes, non striés, ponctués sans ordre.

Dessous noirâtre, rugueux. Prosternum large; mentonnière saillante. Pattes testacé pâle.

Chania R., 7,800 pieds, juillet (R. E. Dent). Collection Fleutiaux et Coryndon Memorial Museum, Nairobi, Kenya Colony.

Voisin de *H. Chappuisi*, Fleutiaux; taille moindre; même forme mais plus convexe; se distingue notamment par les taches testacées.

*ENDICRONYCHUS*, Méquignon, 1931.

*Dicronychus*, Eschscholtz, 1836 (non Brullé, 1832.)

Génotype: *D. senegalensis*, Castelnau.

*E. STRIATUS*, n. sp.

16 mm. Allongé; noir brillant; glabre. Tête convexe; ponctuation forte et serrée. Antennes noires ne dépassant pas la base du pronotum, légèrement comprimée; 3e article notablement plus long que le second, un peu plus court que le 4e. Pronotum un peu plus long que large, trapézoïdal, arrondi aux angles antérieurs, convexe, brusquement déclive à la base; ponctuation forte et peu serrée; angles postérieurs aigus, légèrement carénés. Elytres parallèles jusqu'à la moitié, rétrécis au delà, convexes, profondément striés-ponctués; interstries très convexes et finement pointillés. Dessous noir brillant. Ponctuation du propectus assez forte, moins serrée sur les propleures, effacée tout à fait en arrière. Arrière-corps à ponctuation peu serrée. moins forte sur l'abdomen. Pattes noires.

Kitui Boma, novembre (MacArthur). Muséum, Paris; Machakos, Kenya Colony, novembre (Dr. van Someren). Imperial Institute of Entomology, London.

Se distingue par sa couleur noir brillant, glabre; ses antennes courtes; ses élytres profondément striés. Sa place est dans le voisinage de *D. cruentipennis*, Candèze.

*PANTOLAMPRUS*, Candèze, 1859.

Génotype: *P. nitens*, Candèze.

*P. TERMINATUS*, n. sp.

17 mm. Allongé, elliptique; tête et pronotum noir brillant à léger reflet bronzé, pubescence noire dressée; élytres jaunes avec au sommet une petite tache violette, pubescence jaune dressée. Tête légèrement aplatie en avant; ponctuation peu serrée. Antennes noires, dépassant peu la base du pronotum, serriformes à partir du 3e article. Pronotum à peu près aussi long que large, graduellement rétréci de la base au sommet, peu convexe, brusquement déprimé près de la base; ponctuation peu serrée effacée vers l'arrière. Elytres convexes, fortement

striés-ponctués; interstries très convexes très finement pointillés. Dessous noir brillant; ponctuation légère. Pattes noires.

Mawakota, avril (Dr. van Someren). Collection Fleutiaux, Coryndon Memorial Museum, Nairobi, Kenya Colony et Imperial Institute of Entomology, London.

Cette espèce et quelques autres : *P. sulcicollis*, Schwarz (*Plasoni*, Candèze), *P. ligneus*, Candèze, pourraient, en raison des élytres non métalliques et profondément striés, former un sous-genre pour lequel je proposerai le nom de *XANTHOLAMPRUS*.

*PROPSEPHUS*, Hyslop, 1921.

*Psephus*, Candèze, 1859 (non Kirby, 1826).

Génotype : *P. beniniensis*, Candèze.<sup>(1)</sup>

*P. KAIMOSIUS*, n. sp.

16 mm. 1/2. Allongé, elliptique; brun brillant; pubescence jaune. Tête peu convexe, densément ponctuée. Antennes brunes, dépassant à peine la base du pronotum, subfiliformes; 3e article plus long que le 2e, un peu plus court que le 4e. Pronotum légèrement plus long que large à la base, trapézoïdal, peu convexe, avec deux impressions distinctes en dedans des angles postérieurs; ponctuation légère et peu serrée; angles postérieurs aigus, à peine divergents, brièvement carénés. Elytres parallèles, rétrécis seulement dans le tiers postérieur, convexes, très légèrement ponctués-striés; interstries plans et presque indistinctement pointillés. Dessous de même couleur; ponctuation plus grosse en avant, graduellement plus fine sur l'arrière-corps. Hanches postérieures graduellement rétrécies en dehors. Pattes brunes; lamelles des tarses longues.

Kaimosi, mars-avril (A. Turner). Collection Fleutiaux et Coryndon Memorial Museum, Nairobi, Kenya Colony, et Imperial Institute of Entomology, London.

Voisin de *P. Fleutiauxi*, Schenkling (*P. Alluaudi*, Fleutiaux, 1919, non Fleutiaux, 1903); plus large, plus brillant; pronotum plus rétréci en avant; ponctuation du pronotum beaucoup plus fine et écartée; élytres à stries très légères.

*P. TURNERI*, n. sp.

16 mm. Long, atténué; brun; pubescence jaune. Tête convexe en arrière, plate en avant; ponctuation grosse et serrée. Antennes brun clair, dépassant la base du pronotum, comprimées vers la moitié,

(1) Le génotype désigné à le 3e article des antennes notablement plus long que le 2e, alors que la description du genre dit : 2e très petit, 3e égal à celui-ci ou un peu plus grand, mais, sauf deux exceptions, plus petit que le 4e. A mon sens le choix de *P. elimatus* eut été plus heureux.



amincies au bout; 3e article un peu plus long que le suivant. Pronotum plus long que large, graduellement rétréci en avant, convexe, déclive à la base, sillonné au milieu en arrière; ponctuation grosse et serrée; angles postérieurs longs, aigus, à peine divergents, fortement carénés. Elytres longs atténués, convexes, brusquement déclives à la base, fortement ponctués-striés; interstries à ponctuation très fine et espacée. Dessous de même couleur. Pattes brun clair; lamelles des tarses très longues.

Kaimosi, mars-avril (A. Turner). Muséum, Paris.

Forme allongée de *P. semicastaneus*, Candèze; couleur uniforme, aspect à peine brillant; tête et pronotum fortement et densément ponctués.

*P. GRATIOSUS*, n. sp.

8 1/2 à 9 mm. Allongé; brun à peine brillant; pubescence grise. Tête déprimée au milieu; ponctuation large, superficielle, ombiliquée. Antennes brunes, comprimées, dépassant la base du pronotum; 3e article légèrement plus long que le suivant. Pronotum plus long que large; côtés droits et graduellement rétrécis en avant, convexe, brusquement déprimé à la base et brièvement impressionné au milieu en arrière, ponctué comme la tête; angles postérieurs aigus, longuement carénés. Elytres très légèrement rétrécis en arrière, arrondis au sommet, convexes, fortement ponctués-striés; interstries plans, éparsément pointillés. Dessous de même couleur. Pattes testacées; lamelles des tarses longues.

Bukoba, septembre-novembre (Rev. J. W. Hunt), collection Fleutiaux; Kaimosi, mars-avril (A. Turner). Coryndon Memorial Museum, Nairobi, Kenya Colony.

Voisin de *P. mutatus*, Fleutiaux; moins atténué en avant et en arrière, d'une seule couleur sombre; pronotum relativement moins long.

*P. EPIPLEURALIS*, n. sp.

10 mm. 1/2. Large, ovale; brun, presque noir sur la tête et le pronotum, peu brillant; pubescence grise légère. Tête faiblement impressionnée au milieu; ponctuation forte, serrée, ombiliquée. Antennes fines, ne dépassant pas la base du pronotum, brun clair; 3e article aussi long que le 4e. Pronotum un peu moins long que large à la base, arqué sur les côtés et fortement rétréci en avant, peu convexe, déclive à la base, finement sillonné au milieu en arrière; ponctuation large, ombiliquée, serrée sur les flancs, moins grosse et plus nette au milieu; angles postérieurs aigus, non divergents, nettement carénés près du bord latéral. Elytres arqués sur les côtés et graduellement rétrécis, convexes; légèrement ponctués-striés; interstries plans et

espacement ponctués. Dessous brun, épipleures des élytres ferrugineux. Pattes testacées; lamelles des tarses longues.

Bukoba, septembre-novembre (Rev. J. W. Hunt), collection Fleutiaux et Coryndon Memorial Museum, Nairobi, Kenya Colony.

Rappelle *P. discolor*, Schwarz, pour la forme courte; plus largement ovale; moins convexe; brun peu brillant; 3e article des antennes aussi long que le suivant; pronotum plus rétréci en avant, ponctuation moins grosse sur le dos.

*P. RUGOSISSIMUS*, n. sp.

14 mm. Allongé, atténué; opaque, noir, élytres brun clair; pubescence grise. Tête peu convexe, déprimée en avant, bord antérieur avancé; ponctuation large, ombiliquée, serrée. Antennes brunes, atteignant la moitié du corps, légèrement comprimées, amincies vers le bout; 3e article aussi long que le 4e. Pronotum un peu plus long que large, peu rétréci en avant, peu convexe, impressionné le long de la base, sillonné au milieu en arrière jusque vers la moitié; ponctuation très large, superficielle, ombiliquée, très serrée; angles postérieurs longs, aigus, non divergents, fortement carénés. Elytres longs, légèrement atténués en arrière, très fortement striés de rangées de points gros, nets, profonds et très rapprochés; interstries plans, finement et éparsément pointillés. Dessous noirâtre; pubescence grise; ponctuation grosse et serrée sur le propectus et le métasternum, moins forte et moins serrée sur l'abdomen. Hanches postérieures brusquement élargies en dedans. Pattes ferrugineux obscur; lamelles des tarses longues.

Kaimosi, mars-avril (T. Turner). Muséum, Paris.

Voisin de *P. semicastaneus*, Candèze; aspect opaque; ponctuation beaucoup plus forte et très serrée.

*P. INCURVUS*, n. sp.

11 mm. Oblong; brun brillant, plus foncé sur le pronotum, un peu rougeâtre à la base des élytres; pubescence grise légère. Tête légèrement convexe en arrière, déprimée en avant; bord antérieur saillant; ponctuation inégale, grosse et serrée. Antennes brun clair, ne dépassant pas la base du pronotum, faiblement comprimées; 3e article deux fois plus long que le 2e et moitié moins que le 4e. Pronotum à peu près aussi long que large, arqué sur les côtés, rétréci en arrière, davantage en avant, convexe, brusquement déprimé à la base, sillonné au milieu postérieurement; ponctuation grosse et serrée; bord latéral un peu creusé en gouttière en arrière; angles postérieurs aigus, incurvés, brièvement et nettement carénés en diagonale. Elytres subparallèles, arrondis et rétrécis au delà de la moitié, convexes, fortement ponctués-striés; interstries plans, moins fortement et espacement ponctués. Dessous et pattes de même couleur.

Mombasa, mars (van Someren). Muséum, Paris.

Remarquable par la forme du pronotum légèrement dilaté en dehors près des angles postérieurs incurvés et creusé en dehors de la carène interangulaire. Se place dans le voisinage de *P. opacus*, Fleutiaux.

*P. SCABER*, n. sp.

10 mm. 1/2. Oblong; brun, un peu plus clair sur les élytres, opaque; pubescence grise. Tête presque plate; ponctuation large, ombiliquée, bien marquée. Antennes fines, filiformes, dépassant à peine la base du pronotum, brunes; 3e article deux fois plus long que le 2e et beaucoup moins que le 3e. Pronotum légèrement plus long que large, peu rétréci en avant, convexe, brusquement déclive en arrière; ponctuation ombiliquée et rugueuse; angles postérieurs aigus, non carénés. Elytres faiblement rétrécis en arrière, arrondis au sommet, très convexes; ponctués-striés; interstries rugueux. Dessous et pattes de même couleur. Lamelles des tarses longues.

Sekoke, juillet (A. Turner). Muséum, Paris.

Rappelle *P. granulipennis*, Candèze; antennes filiformes; 3e article notablement plus long que le 2e; stries des élytres plus fortement ponctuées; interstries non granuleux, simplement rugueux.

*P. SOMERENI*, n. sp.

10 mm. Ovale; noir peu brillant; pubescence noire. Tête peu convexe, abaissée en avant, fortement et densément ponctuée. Antennes noires, dépassant légèrement la base du pronotum, submoniliformes, à articles triangulaires; 3e notablement plus long que le 2e et légèrement plus court que le 4e. Pronotum aussi long que large à la base très rétréci en avant de la base au sommet, convexe, brusquement déclive à la base; ponctuation forte, régulière et serrée; angles postérieurs aigus, non divergents, carénés en diagonale. Elytres subparallèles jusqu'après la moitié, rétrécis au delà, convexes, striés, uniformément et finement ponctués. Dessous noir, ponctuation légère. Hanches postérieures graduellement rétrécies en dehors. Pattes noires; lamelles des tarses peu développées.

Nairobi, mai (Dr. van Someren). Collection Fleutiaux et Coryndon Memorial Museum, Nairobi, Kenya Colony.

Aspect d'un *Lissomus*. Ressemble à *P. discolor*, Schwarz; forme plus courte, aspect moins brillant; pronotum moins arrondi en avant, ponctuation plus serrée; élytres plus uniformément et densément ponctués.

*P. NAIROBIANUS*, n. sp.

9 mm. 1/2. Ovale; noir, pronotum largement bordé de jaune latéralement, sauf à l'extrémité des angles postérieurs, élytres égale-



ment bordés de jaune jusqu'à la troisième strie; pubescence grise, courte et clairsemée. Tête plate, abaissée en avant, fortement et densément ponctuée. Antennes noires, ne dépassant pas la base du pronotum, légèrement serriformes à partir du 3e article qui est presque aussi long que le suivant. Pronotum à peine aussi long que large à la base, arrondi sur les côtés et notablement rétréci en avant, convexe, fortement et densément ponctué; angles postérieurs courts, aigus, brièvement et faiblement carénés. Elytres arqués sur les côtés, convexes, fortement ponctués-striés; interstries, convexes et plus finement ponctués. Dessous noir côtés des propleures, sauf l'extrémité des angles postérieurs et épipleures des élytres jaunes; pubescence grise plus apparente qu'en dessus. Hanches postérieures graduellement rétrécies en dehors. Pattes noires; lamelles des tarses peu développées.

Nairobi, avril (Dr. van Someren). Muséum, Paris.

Même forme courte que *P. Somereni*, en diffère par la large bordure externe jaune.

*P. MERUANUS*, n. sp.

11 mm. 1/2. Oblong, épais; noir peu brillant; pubescence noire. Tête plate, biimpressionnée, fortement et densément ponctuée. Antennes noires, ne dépassant pas la base du pronotum, légèrement serriformes à partir du 3e article; ce dernier presque aussi long que le suivant. Pronotum aussi long que large, arrondi sur les côtés et notablement rétréci en avant, très convexe, brusquement déclive à la base; ponctuation forte et serrée; angles postérieurs longs, aigus, carénés. Elytres un peu élargis jusqu'au delà de la moitié, arrondis et rétrécis en arrière, très convexes, fortement ponctués-striés; interstries convexes et plus finement ponctués. Dessous noir; ponctuation moins grosse qu'en dessus. Hanches postérieures graduellement rétrécies en dehors. Pattes noires. Lamelles des tarses peu développées.

Méru, mai (Dr. van Someren). Muséum, Paris.

Plus grand et plus massif que *P. somereni*; plus convexe; élytres dilatés en arrière.

*P. MACARTHURI*, n. sp.

11 mm. Allongé; brun noir brillant; pubescence brune. Tête peu convexe légèrement impressionnée au milieu; ponctuation assez forte et serrée. Antennes noirâtres, dépassant la base du pronotum, comprimées; 3e article plus long que le 2e et moitié moins long que le 4e. Pronotum plus long que large, légèrement rétréci en avant; côtés cintrés; surface convexe en avant, impressionnée le long de la base, finement sillonnée au milieu en arrière; ponctuation moins pro-



fonde et moins serrée que sur la tête; angles postérieurs dirigés en dehors dans la prolongement du bord latéral, aigus et carénés. Elytres plus larges que le pronotum, parallèles jusqu'à la moitié, rétrécis au delà et arrondis au sommet, convexes, brusquement déclives à la base, finement striés-ponctués; interstries éparsément ponctués. Dessous de même couleur, épipleures et bord inférieur des élytres rougeâtres. Pattes brunes; lamelles des tarses longues.

Kitui Boma, novembre (MacArthur). Muséum, Paris.

Même forme que *P. ischiodontoides*, Fleutiaux; noirâtre; 3e article des antennes notablement plus court que le 4e.

*P. GEDYEI*, n. sp.

11 mm. Allongé; brun rougeâtre; pubescence brunâtre. Tête convexe, déprimée au milieu; bord antérieur saillant; ponctuation grosse, ombiliquée, serrée. Antennes brunes, comprimées, dépassant peu la base du pronotum; 3e article de même longueur que le 4e. Pronotum légèrement plus long que large, rétréci en avant, peu convexe, brusquement déclive en arrière, sillonné au milieu à la base; ponctuation grosse, ombiliquée, serrée; angles postérieurs aigus, non divergents, fortement carénés près du bord latéral. Elytres parallèles, arrondis en arrière au delà de la moitié, convexes, fortement ponctués-striés; interstries plus finement, légèrement et espacément ponctués. Dessous de même couleur. Pattes plus claires; lamelles des tarses longues.

Kaimosi, mars-avril (A. Turner). Muséum, Paris.

Forme allongée comme *P. ineptus*, Candèze; plus parallèle; tête impressionnée au milieu, bord antérieur plus avancé; ponctuation du pronotum plus grosse, carène des angles postérieurs plus nette; élytres plus parallèles, interstries à ponctuation plus légère et plus espacée.

Dédié à M. A. F. J. Gedye, du Coryndon Memorial Museum, de Nairobi.

*P. MARAGOLINUS*, n. sp.

8 1/2 à 9 mm. Allongé; noir peu brillant; pubescence brune. Tête plate, impressionnée au milieu, fortement et densément ponctuée. Antennes brunes ou noirâtres, dépassant à peine la base du pronotum, subfiliformes; 3e article aussi long que le 4e. Pronotum à peu près aussi long que large, légèrement arqué sur les côtés, rétréci en avant, peu convexe, brusquement déclive tout à fait à la base, sillonné au milieu en arrière; moins fortement et densément ponctué que la tête; angles postérieurs aigus, non divergents, légèrement carénés. Elytres atténués, convexes, striés-ponctués; interstries plans, espacément et plus finement ponctués. Dessous noir. Pattes brunes ou noirâtres; lamelles des tarses longues.

Maragoli, octobre (Dr. van Someren). Collection Fleutiaux et Coryndon Memorial Museum, Nairobi, Kenya Colony.

Plus petit que *P. brunneiventris*, Schwarz; noir; pubescence brune; élytres graduellement atténués.

*P. BUKOBANUS*, n. sp.

14 mm. Elliptique; noirâtre, peu brillant; pubescence jaune. Tête peu convexe; ponctuation assez forte et serrée. Antennes brun rougeâtre, filiformes, ne dépassant pas la base du pronotum; 2e et 3e articles petits, subglobuleux, subégaux. Pronotum à peu près aussi long que large à la base, graduellement et fortement rétréci en avant, convexe en avant, brusquement déclive à la base, sillonné au milieu en arrière; ponctuation presque aussi grosse que sur la tête, serrée; angles postérieurs longs, aigus, non divergents, fortement carénés. Elytres atténués, convexes, légèrement striés-ponctués; interstries plans et finement pointillés. Dessous de même couleur; ponctuation légère. Hanches postérieures anguleusement rétrécies en dehors. Pattes brunes; lamelles des tarses longues.

Bukoba, septembre-novembre (Rev. J. W. Hunt). Collection Fleutiaux et Coryndon Memorial Museum, Nairobi, Kenya Colony.

Sa forme elliptique et les 2e et 3e articles des antennes petits le rapprochent de *P. valens*, Candèze; taille moindre; plus noir, ponctuation du pronotum moins serrée, non rugueuse; stries des élytres plus légères; épipleures de la même couleur que les élytres; pattes brunes.

*P. ZIWANIUS*, n. sp.

12 mm. Allongé; brun noir opaque; pubescence grise. Tête peu convexe en arrière, aplatie en avant, fortement et densément ponctuée. Antennes brunes, dépassant peu la base du pronotum, filiformes, plus minces vers le bout; 3e article un peu plus long que le 2e et plus court que le 4e. Pronotum plus long que large, graduellement rétréci en avant, convexe, brusquement déclive à la base, brièvement sillonné au milieu en arrière; ponctuation forte, moins serrée que sur la tête; angles postérieurs à peine divergents, aigus, non carénés. Elytres longs, graduellement rétrécis en arrière, très convexes, brusquement déclives à la base; ponctuation peu serrée surtout vers le bout, plus grosse à la base; stries fines. Dessous de même couleur. Pattes brunes; lamelles des tarses longues.

Ziwani, avril (MacArthur). Muséum, Paris.

Ressemble à *P. granulipennis*, Candèze; 3e article des antennes un peu plus long que le 2e; pronotum et élytres plus longs; ces derniers non rugueux.

*P. CASTANEUS*, n. sp.

8 mm. 1/2. Allongé, brun peu brillant; pubescence grise. Tête aplatie, abaissée en avant, assez fortement et densément ponctuée. Antennes brun clair, filiformes, ne dépassant pas la base du pronotum; 2e et 3e articles courts, égaux; 4e plus long. Pronotum légèrement plus long que large, peu rétréci en avant, peu convexe, sillonné au milieu en arrière; ponctuation assez grosse sur les côtés, plus fine et moins serrée sur le dos; angles postérieurs aigus, non divergents, indistinctement carénés. Elytres atténués, convexes, fortement striés-ponctués; interstries plans, finement et espacément pointillés. Dessous plus foncé. Pattes brun clair.

Kaimosi, mars-avril (A. Turner). Collection Fleutiaux et Coryndon Memorial Museum, Nairobi, Kenya Colony.

Aspect de *P. puerilis*, Schwarz; plus étroit; stries des élytres notablement plus fortes et plus profondes.

*P. HUNTI*, n sp.

9 1/2 à 10 mm. Allongé; noir peu brillant; pubescence brune mélangée de quelques poils gris. Tête peu convexe, fortement et densément ponctuée. Antennes noires, ne dépassant pas la base du pronotum, filiformes; 3e article un peu plus long que le 2e, beaucoup plus court que le 4e et d'une autre forme. Pronotum à peine plus long que large, très rétréci en avant, convexe, brusquement déclive tout à fait en arrière; ponctuation grosse et très dense; angles postérieurs aigus, non divergents; légèrement carénés. Elytres très atténués, convexes, fortement striés-ponctués; interstries convexes et ponctués moins fortement. Dessous et pattes noirs; lamelles des tarses longues.

Bukoba, septembre-novembre (Rev. J. W. Hunt). Collection Fleutiaux et Coryndon Memorial Museum, Nairobi, Kenya Colony.

Ressemble à *P. maragolinus*; plus large à la base du pronotum et des élytres, d'une forme elliptique; 3e article des antennes plus court que le 4e et d'une autre forme; ponctuation du pronotum beaucoup plus dense et plus grosse; interstries des élytres convexes et sub-rugueux.

*MELANTHOIDES*, Candèze, 1865.

Génotype: *M. latimanus*, Candèze.

*M. BRUNNEUS*, n. sp.

11 mm. Allongé, étroit; brun rougeâtre; pubescence grise. Tête triangulairement aplatie au milieu en avant; ponctuation assez serrée. Antennes brunes, testacées à la base, filiformes, ne dépassant pas la base du pronotum; 3e article plus long que le 2e et plus court que le 4e. Pronotum notablement plus long que large, légèrement sinué

latéralement, convexe, très faiblement sillonné au milieu; ponctuation assez forte et peu serrée; angles postérieurs longs, aigus, divergents, carénés. Elytres parallèles jusque vers la moitié, rétrécis au delà, convexes, finement ponctués-striés; interstries plans, très légèrement et éparsément pointillés. Dessous de même couleur, finement et densément ponctué. Pattes testacé pâle.

Lower Tana-Sabaki, avril-mai (Turner et MacArthur). Muséum, Paris.

Plus long et plus foncé que *M. plancus*, Erichson; plus convexe; pronotum plus fortement ponctué.

*PHEDOMENUS*, Candèze, 1889.

Génotype: *P. venustus*, Candèze.

Subgen. *Domenephus*, Fleutiaux (type: *P. flavangulus*, Candèze).

*P. GEDYEI*, n. sp.

4 1/2 à 5 mm. Court, large, ovale; jaune, orné d'un dessin noir plus ou moins étendu occupant le milieu du pronotum, la moitié antérieure des élytres (sauf un espace huméral) et une bande irrégulière transversale près de l'extrémité, prolongée sur la suture jusqu'au sommet; pubescence gris jaunâtre. Tête régulièrement convexe, arrondie en avant; ponctuation fine et peu serrée. Antennes fines, filiformes, testacé clair, ne dépassant pas la base du pronotum; 3e et suivants plus longs et plus gros. Pronotum légèrement plus long que large, arrondi sur les côtés, rétréci en avant, plus faiblement en arrière, peu convexe, brusquement déclive à la base, brillant; ponctuation fine et peu serrée; angles postérieurs grands, aigus, non divergents, carénés près du bord latéral; carène prolongée jusque vers la moitié et continuée en avant sous forme de côte obtuse. Elytres courts, plus étroits que le pronotum, arqués sur les côtés et rétrécis en arrière, conjointement arrondis au sommet, peu convexes, à peine brillants, ponctués-striés; interstries plans, finement pointillés. Dessous et pattes testacé clair.

Kampala, décembre (A. F. J. Gedye). Collection Fleutiaux et Coryndon Memorial Museum, Nairobi, Kenya Colony.

Forme courte de *P. angularis*, Schwarz; très reconnaissable à son dessin noir sur fond jaune.

*ÆOLOIDES*, Schwarz, 1906.

Génotype: *Heteroderes sequester*, Candèze.

*Æ. RABAINUS*, n. sp.

5 mm. 3/4. Oblong; noir peu brillant; pubescence noirâtre. Tête peu convexe, arrondie en avant; ponctuation fine, irrégulière; serrée.



Antennes grêles, ne dépassant pas la base du pronotum, brunes; 2e article long, presque autant que le 3e et de même forme. Pronotum aussi long que large, légèrement arqué sur les côtés, arrondi et rétréci en avant, très faiblement rétréci en arrière, peu convexe, assez brusquement déclive vers la base; ponctuation espacée, entremêlée de points très fins et très légers; angles postérieurs courts, déprimés en dessus, à peine divergents, arrondis à la pointe, longuement carénés. Elytres légèrement arqués sur les côtés, rétrécis en arrière au delà de la moitié, peu convexes, ponctués-striés; interstries plans, finement et densément pointillés. Dessous de même couleur. Pattes brunes.

Rabai, janvier-février (A. F. J. Gedye). Muséum, Paris.

Différent de *Æ. spissus*, Candèze par la forme moins convexe, un peu étranglée vers la base du pronotum et des élytres; l'aspect plus brillant, la pubescence noire; le pronotum faiblement rétréci en arrière; les élytres arrondis à partir des épaules.

### *Æ. CONVEXUS*, n. sp.

7 mm. Oblong, convexe; brun noir opaque; pubescence jaune. Tête convexe, densément et inégalement ponctuée. Antennes testacées, subfiliformes, n'atteignant pas la base du pronotum; 2e et 3e articles égaux, un peu plus courts que le suivant. Pronotum plus long que large, parallèle, arrondi aux angles antérieurs, convexe, brusquement déclive en arrière; ponctuation forte, écartée, fine dans les intervalles des gros points; angles postérieurs grands, aigus, non divergents, brièvement unicarénés. Elytres parallèles jusque vers la moitié, arrondis et rétrécis au delà, convexes, ponctués-striés; interstries finement rugueux. Dessous de même couleur. Pattes testacées.

Sekoke, juillet (A. Turner). Muséum, Paris.

Convexe comme *Æ. spissus*, Candèze, mais plus allongé et plus étroit; pronotum notablement plus long; stries des élytres moins fortement ponctuées, interstries tout à fait plans.

*ANCHASTUS*, J. Leconte, 1853.

Génotype: *A. digitatus*, J. Leconte.

### *A. UMBILICATUS*, n. sp.

7 mm. Elliptique; brun noir; pubescence jaune. Tête convexe; bord antérieur arrondi; ponctuation assez grosse, ombiliquée, serrée. Antennes testacées, subfiliformes; 3e article de même longueur que le 4e. Pronotum aussi long que large à la base, trapézoïdal, peu convexe; ponctuation large, superficielle, ombiliquée, peu serrée sur le dos, dense et rugueuse sur les côtés; angles postérieurs aigus, non divergents, brièvement et finement bicarénés. Elytres peu convexes, finement striés; interstries plans et rugueux. Dessous de même couleur;

punctuation forte et ombiliquée sur le prosternum, rugueuse sur les propleures, légèrement marquée sur l'arrière-corps. Pattes testacées.

Thua River, novembre (MacArthur). Muséum, Paris.

Voisin de *A. Weisei*, Schwarz; moins grand, noirâtre; pronotum trapézoïdal à punctuation plus large et superficielle sur le dos.

*MELANOXANTHUS* (Eschscholtz), Castelnau, 1836.

Génotype: *Elater melanocephalus*, Fabricius.

*M. CONSIMILIS*, n. sp.

5 mm. Allongé; noir brillant, avec une grande tache jaune ivoire au milieu des élytres; pubescence noire. Tête convexe; punctuation assez forte, peu serrée. Antennes noires, épaisses, n'atteignant pas la base du pronotum; 2e et 3e articles subégaux; 3e plus long que le suivant. Pronotum plus long que large, à peine rétréci en avant, convexe, brusquement déclive à la base; punctuation peu profonde, ombiliquée, espacée; angles postérieurs aigus, non divergents, carénés. Elytres atténués de la base au sommet, rugueux à la base, fortement ponctués en rangées, mais non striés. Dessous et pattes noirs. Hanches postérieures plus larges en dehors que les épisternes métathoraciques.

Kaimosi, mars-avril (A. Turner). Muséum, Paris.

Appartient au groupe homogène *lateplagiatus*, Fairmaire, *bilunatus*, Candèze, *bistellatus*, Candèze; plus grand que ce dernier, plus allongé, moins elliptique; pronotum sensiblement plus long que large, entièrement noir.

*CARDIOPHORUS*, Eschscholtz, 1829.

Génotype: *Elater gramineus*, Scopoli.

*C. TURNERI*, n. sp.

4 mm. 3/4 à 6. Oblong; noir brillant; pubescence obscure, grisâtre sur les bords. Tête peu convexe, finement et densément ponctuée. Antennes noires, brunes à la base, ne dépassant pas la base du pronotum; articles épaissis au sommet; 2e un peu plus court que le suivant. Pronotum aussi long que large, arrondi sur les côtés, également rétréci en avant et en arrière, très convexe, brusquement déclive à la base; punctuation nette, fine et serrée, entremêlée de quelques points un peu plus gros; angles postérieurs courts, obtus, nullement divergents, brièvement carénés latéralement; limites latérales inférieures courbes, bien marquées, presque entières, effacées seulement tout près du bord antérieur; sillons basilaires longs. Elytres ovales, arrondis au sommet, convexes, fortement ponctués-striés; interstries très finement et espacement pointillés. Dessous noir. Pattes brunes.

Variété *ornaticollis*. Pronotum rouge avec une tache noire au milieu en avant. Variation similaire à celle que présente *C. histrio*, Erichson.

Naivasha, mai (H. J. A. Turner). Collection Fleutiaux et Coryndon Memorial Museum, Nairobi, Kenya Colony.

Aspect de *Dicronychus magnicollis*, Fleutiaux; mais par ses griffes simples est un vrai *Cardiophorus*. Ponctuation du pronotum moins égale; angles postérieurs nullement redressés, obtus au sommet. Élytres moins ovales. Antennes noires, plus courtes. Pattes brunes.

*C. SOMERENI*, n. sp.

13 mm. Allongé, robuste; brun, plus clair sur les élytres; pubescence grise. Tête plate en avant, inégalement, mais densément ponctuée. Antennes brun clair, ne dépassant pas la base du pronotum, fines; articles élargis vers le bout. Pronotum aussi long que large, sinué sur les côtés, convexe; ponctuation inégale, assez serrée; angles postérieurs courts, redressés, brièvement et obtusément carénés; limites latérales inférieures effacées en avant. Élytres rétrécis seulement au delà de la moitié, convexes, fortement ponctués-striés; interstries légèrement convexes, finement et rugueusement ponctués. Dessous brun noirâtre, plus clair sur le prosternum; ponctuation fine et serrée. Pattes brun noirâtre, plus clair sur le prosternum; ponctuation fine et serrée. Pattes brun noirâtre; tibias antérieurs et tarses brun clair.

W. F. Leg, Kibwezi, décembre (Dr. van Someren). Muséum, Paris.

Ressemble à *C. chappuisi*, Fleutiaux; plus robuste; ponctuation du pronotum irrégulière, mélangée de points fins et de points plus gros. Antennes plus courtes à articles légèrement noueux. Stries des élytres plus fortement ponctuées; interstries faiblement convexes.

*C. KAIMOSIUS*, n. sp.

8 à 8 mm. 1/2. Allongé; brun noir à peine brillant, plus clair aux épaules; pubescence grise. Tête plate, rebordée en avant; ponctuation serrée. Antennes brunes, filiformes, dépassant la base du pronotum; 2e et 3e articles subégaux, plus courts que le suivant. Pronotum plus long que large, parallèle, peu convexe; ponctuation inégale; sillons basilaires nuls; angles postérieurs non divergents, carénés; limites latérales inférieures à peine distinctes seulement en arrière. Élytres légèrement plus larges que le pronotum à la base, parallèles, arrondis et rétrécis en arrière, fortement ponctués-striés; interstries finement pointillés. Dessous de même couleur. Pattes brunes.

Kaimosi, mars-avril (A. Turner). Collection Fleutiaux et Coryndon Memorial Museum, Nairobi, Kenya Colony.



Voisin de *C. obsoletus*, Gerstaecker; plus allongé; moins brillant; antennes plus longues; pronotum parallèle; élytres plus larges que le pronotum.

*C. NAIROBIANUS*, n. sp.

9 mm. Allongé; testacé à reflet obscur; pubescence grise. Tête plate, rétrécie en avant; bord antérieur arrondi; ponctuation fine et serrée. Antennes testacées, filiformes, dépassant la base du pronotum; 2e article deux fois plus court que le 3e; suivants égaux. Pronotum légèrement plus long que large, sinué sur les côtés, non rétréci en avant, convexe, brusquement déclive en arrière, très finement et densément ponctué; sillons basilaires bien marqués; angles postérieurs petits, non divergents, carénés en dehors; limites latérales inférieures légères, visibles seulement en arrière. Elytres plus larges que le pronotum à la base, subovales, convexes, fortement ponctués-striés; interstries convexes et très finement pointillés. Dessous de même couleur. Pattes testacées, longues et minces.

Nairobi, avril, à la lumière (van Someren). Muséum, Paris.

De couleur plus pâle que *C. ocularius*, Fleutiaux; tête rétrécie en avant, à bord antérieur non transversal; yeux moins gros; pronotum de même forme; ponctuation plus fine, plus nette, plus régulière et serrée; pattes plus minces et plus longues.

*C. TANANUS*, n. sp.

6 mm. 1/2. Allongé; noir peu brillant, extrême base des élytres rougeâtre; pubescence sombre. Tête peu convexe; bord antérieur légèrement saillant, rougeâtre, largement arrondi; ponctuation fine et serrée. Antennes testacées, subfiliformes, ne dépassant pas la base du pronotum; 2e article presque aussi long que le 3e. Pronotum un peu plus long que large, arqué sur les côtés, rétréci en arrière, d'avantage en avant, convexe, brusquement déclive vers la base; ponctuation fine, égale, serrée; angles postérieurs courts, aplatis, non divergents; sillons basilaires assez longs; limites latérales inférieures courbes, complètes. Elytres parallèles jusqu'à la moitié, arrondis et rétrécis en arrière, peu convexes, ponctués-striés, plus fortement sur les côtés; interstries plans, très finement pointillés. Dessous noir. Pattes testacées.

Lower Tana-Sabaki, avril-mai (Turner—MacArthur). Muséum, Paris.

Diffère de *C. disjunctus*, Fleutiaux, par la taille un peu moindre; l'extrême base des élytres rougeâtre; le pronotum plus rétréci en avant qu'en arrière, sa ponctuation plus fine.



*C. DUPLICATUS*, n. sp.

7 mm. Allongé; noir peu brillant, avec une petite tache rousse aux épaules; pubescence obscure. Tête peu convexe; bord antérieur largement arrondi; ponctuation double, des gros points écartés peu marqués entremêlés de petits. Antennes brunes, subfiliformes, ne dépassant pas la base du pronotum; 2e article subégal aux suivants. Pronotum plus long que large, légèrement cintré sur les côtés, un peu plus rétréci en avant qu'en arrière, peu convexe; ponctuation double comme sur la tête; sillons basilaires bien marqués; angles postérieurs courts, non divergents, carénés; limites latérales inférieures effacées en avant. Elytres plus larges que le pronotum à la base, subparallèles, arrondis et rétrécis au delà de la moitié, convexes, ponctués-striés, légèrement dans la région suturale, fortement sur les côtés; interstries plans, très finement et éparsément pointillés. Dessous noir. Pattes brunes.

Nairobi, 5,450 pieds, novembre (A. F. J. Gedye). Collection Fleutiaux et Coryndon Memorial Museum, Nairobi, Kenya Colony.

Ressemble à *C. tananus*; pronotum légèrement plus long, moins rétréci en avant; ponctuation double sur la tête et le pronotum.

*C. THUANUS*, n. sp.

6 mm. 1/2. Allongé; brillant, noirâtre, bord antérieur du pronotum brun, élytres brun plus clair surtout à la base; pubescence grise. Tête déprimée; bord antérieur transversal; ponctuation fine et serrée. Antennes brun clair, subfiliformes, dépassant légèrement la base du pronotum; 2e article plus court que le 3e; celui-ci plus court que le 4e. Pronotum aussi long que large, faiblement arqué sur les côtés, également rétréci en avant et en arrière, convexe; ponctuation fine, égale, nette et serrée; sillons basilaires courts; angles postérieurs courts, non divergents, carénés; limites latérales inférieures effacées en avant. Elytres arqués sur les côtés, rétrécis vers le bout, convexes, assez fortement ponctués-striés, faiblement convexes et pointillés. Dessous noirâtre. Pattes brun clair.

Thua River, novembre (MacArthur). Muséum, Paris.

Diffère de *C. gerstaeckeri*, Fleutiaux, par le pronotum proportionnellement plus large, à ponctuation plus fine, les élytres plus courts.

*DICRONYCHUS*, Brullé, 1832.

Génotype: *D. obesus*, Brullé.

*D. GEDYEI*, n. sp.

7 à 7 mm. 1/2. Oblong; brun noir brillant, plus clair sur les élytres; pubescence grise. Tête peu convexe, finement ponctuée. Antennes testacé pâle, ne dépassant pas la base du pronotum, faible-

ment serriformes; 2e et 3e articles presque aussi longs que le suivant. Pronotum à peu près aussi long que large, arqué sur les côtés, à peine rétréci en avant, convexe, assez brusquement déclive en arrière; ponctuation fine et peu serrée; sillons basilaires assez longs, peu marqués; limites latérales fines, courbes; angles postérieurs courts, redressés, brièvement carénés. Elytres subparallèles, arrondis à partir de la moitié, convexes, ponctués-striés, plus faiblement dans la partie dorsale; interstries plans, finement pointillés. Dessous brun; pubescence grise plus dense sur l'arrière-corps. Pattes testacé pâle.

Rejaf, juillet (A. F. J. Gedye); Mangalla, août (A. F. J. Gedye). Collection Fleutiaux et Coryndon Memorial Museum, Nairobi, Kenya Colony.

Ressemble à *D. tertius*, Fleutiaux; moins brillant; ponctuation du pronotum moins fine, stries des élytres moins fortement ponctuées.

#### *D. LITTORALIS*, n. sp.

7 mm. Allongé; brun brillant, plus clair sur les élytres; pubescence grise. Tête légèrement convexe, arquée en avant, finement ponctuée. Antennes testacées, fines, ne dépassant pas la base du pronotum, à articles un peu épaissis au sommet; 2e sensiblement aussi long que le suivant. Pronotum très légèrement plus long que large, arqué sur les côtés, également rétréci en avant et en arrière, convexe, brusquement déclive à la base; ponctuation très fine, peu serrée; sillons basilaires bien marqués; angles postérieurs courts, aplatis, non divergents, brièvement carénés; limites latérales inférieurs effacées en avant. Elytres légèrement plus larges que le pronotum à la base, subparallèles jusque vers la moitié, arrondis et rétrécis au delà, ponctués-striés, plus fortement sur les côtés; interstries plans, très finement pointillés. Dessous de même couleur. Pattes testacées.

Mombasa, avril (van Someren). Muséum, Paris.

Ressemble à *D. hunti*, mais entièrement brun avec les élytres plus clairs; 2e et 3e articles des antennes sensiblement égaux; ponctuation du pronotum très fine, égale et peu serrée.

#### *D. SECLUSUS*, n. sp.

6 mm. 1/2. Allongé; brun clair, brillant; pubescence grise. Tête déprimée; bord antérieur transversal; ponctuation fine et serrée. Antennes brunes, subfiliformes, dépassant la base du pronotum; 2e article plus court que le 3e; ce dernier de même longueur que le suivant. Pronotum un peu plus long que large, légèrement sinué sur les côtés, faiblement élargi en avant, peu convexe; ponctuation fine, régulière et serrée; sillons basilaires nuls; angles postérieurs petits à peine divergents au sommet, carénés; limites inférieures légères, effacées en avant. Elytres plus larges que le pronotum à la base,

rétrécis au delà de la moitié, peu convexes, ponctué-striés, plus fortement sur les côtés; interstries plans, finement pointillés, plus distinctement vers le bout. Dessous de même couleur. Pattes plus claires.

Thua River, novembre (MacArthur). Muséum, Paris.

Diffère de *D. littoralis* par le pronotum plus longuement rétréci en arrière, plus large en avant, sans sillons basilaires, la ponctuation un peu plus forte et plus serrée.

*D. HUNTI*, n. sp.

7 mm. Allongé; noir peu brillant avec une petite tache rouge aux épaules; pubescence obscure. Tête peu convexe; bord antérieur largement arrondi, anguleux de chaque côté; ponctuation assez grosse et peu serrée. Antennes noirâtres brunes vers le bout, articles élargis au sommet, les derniers moins épais; 2e moins long que le 3e. Pronotum un peu plus long que large, légèrement arqué latéralement, à peu près également rétréci en avant et en arrière, peu convexe, brusquement déclive à la base, brièvement impressionné au milieu en arrière; ponctuation grosse et écartée en avant, moins forte en arrière, entremêlée de points plus fins; sillons basilaires bien marqués; angles postérieurs courts, aplatis, non divergents, brièvement carénés latéralement; limites inférieures bien marquées, entières. Elytres un peu plus larges que le pronotum, parallèles, arrondis vers l'extrémité, convexes, assez fortement ponctué-striés, plus légèrement au sommet; interstries presque plans, à pointillé fin et espacé. Dessous noir. Pattes testacées.

Bukoba, septembre-novembre (Rev. J. W. Hunt). Muséum, Paris.

Ressemble à *D. Gedyei*; plus étroit; pronotum relativement plus long, à ponctuation double; élytres noirs avec une tache rouge aux épaules, stries moins fortement ponctuées.

*D. MILITARIS*, n. sp.

6 mm. 1/2. Allongé; noir brillant avec une tache rouge à l'angle huméral des élytres; pubescence grise. Tête faiblement convexe; ponctuation fine et serrée. Antennes testacées, grêles, subfiliformes, ne dépassant pas la base du pronotum; 2e article plus court que le 3e; celui-ci aussi long que le suivant. Pronotum à peine plus long que large, arqué sur les côtés, également rétréci en avant et en arrière, convexe, brusquement déclive en arrière; ponctuation très fine, régulière, assez serrée; sillons basilaires longs, bien marqués; angles postérieurs courts, aigus, non divergents, carénés; limites latérales inférieures effacées en avant. Elytres ovales, convexes, fortement ponctué-striés; interstries plans, très finement pointillés. Dessous noir. Fémurs noirs; tibias et tarses bruns.



Rejaf, juillet (A. F. J. Gedyé). Muséum, Paris.

Diffère de *D. Hunti* par l'aspect plus brillant, la tache rouge des épaules plus grande; ponctuation du pronotum très fine et uniforme; les antennes testacées; les fémurs noirs.

*D. GRANDICOLLIS*, n. sp.

11 mm. Allongé; noir, élytres brun rougeâtre, opaque; pubescence grise très légère. Tête plate, arrondie transversalement en avant; ponctuation fine et serrée. Antennes noires, fines, ne dépassant pas la base du pronotum; articles épaissis au sommet; 2e plus court que le suivant; 3e aussi long que le 4e. Pronotum plus long que large, sinué sur les côtés, amplement arrondi en avant, rétréci en arrière, très convexe, brusquement déclive à la base; ponctuation fine, nette et serrée; sillons basilaires nuls; angles postérieurs courts non divergents, brièvement carénés; limites latérales inférieures effacées en avant. Elytres un peu plus larges que le pronotum à la base, ovales, convexes, fortement ponctués-striés, un peu moins dans la région suturale; interstries convexes, finement ponctués. Dessous noir, très finement et densément ponctué. Pattes noires.

W. F. Leg, Kibwezi, décembre (Dr. van Someren). Muséum, Paris.

Remarquable par le pronotum amplement arrondi en avant et rétréci en arrière, convexe, et par les élytres en ovale allongé.

*D. RUBRIPENNIS*, n. sp.

9 mm. Allongé; opaque, noir, élytres brun roux, sauf à l'extrémité; pubescence grise. Tête plate, finement et très densément ponctuée. Antennes noires, articles épaissis au sommet; 2e court; 3e un peu plus long, 4e plus long que le 3e. Pronotum plus long que large, légèrement cintré sur les côtés, à peu près aussi large en avant qu'en arrière, peu convexe; ponctuation fine et serrée; sillons basilaires nuls; angles postérieurs courts, non divergents, brièvement carénés; limites latérales inférieures effacées en avant. Elytres un peu plus larges que le pronotum à la base, arqués sur les côtés, rétrécis en arrière, peu convexes, fortement ponctué-striés; interstries plans, très finement pointillés. Dessous et pattes noirs.

W. F. Leg, Kibwezi, décembre (Dr. van Someren). Muséum, Paris.

Ressemble à *D. grandicollis* pour la couleur; moins convexe; pronotum non élargi en avant; élytres moins ovales; 3e article des antennes plus court que le 4e.

*D. VARIOLOSUS*, n. sp.

8 mm. Allongé; opaque, tête et pronotum noirs, élytres bruns; pubescence grise. Tête peu convexe, grossièrement et subrugueuse-



ment ponctuée. Antennes brunes, grêles, ne dépassant pas la base du pronotum, à articles épaissis au sommet; 2e plus court que le 3e; suivants égaux. Pronotum plus long que large, parallèle, arrondi et rétréci en avant au delà de la moitié, convexe, brusquement déclive à la base; ponctuation large, peu profonde, peu serrée, entremêlée de points petits; sillons basilaires bien marqués; angles postérieurs courts, non divergents, carénés; limites latérales inférieures courbes, presque entières. Elytres parallèles, arrondis au sommet, convexes, très fortement ponctués-striés, un peu moins vers le bout; interstries très finement pointillés. Propectus noir; arrière-corps brun. Pattes testacé pâle.

Siri N. Rav, juin (H. J. A. Turner). Muséum, Paris.

Remarquable par sa forme parallèle, la ponctuation double de la tête et du pronotum et par la grosse ponctuation des stries des élytres.

*D. REJAFUS*, n. sp.

7 mm. Allongé; brillant, tête et pronotum noirs, élytres bruns, plus pâles latéralement; pubescence grise. Tête étroite, peu convexe, finement et densément ponctuée; bord antérieur arrondi; yeux gros. Antennes brunes, ne dépassant pas la base du pronotum; 2e article plus court que les suivants. Pronotum plus long que large, arqué sur les côtés, légèrement rétréci en arrière, convexe, brusquement déclive en arrière, sillonné au milieu à la base; ponctuation fine, régulière, nette et serrée; sillons basilaires courts, bien marqués; angles postérieurs courts, non divergents, carénés; limites latérales inférieures presque entières. Elytres légèrement plus larges que le pronotum à la base, arqués sur les côtés, convexes, fortement ponctués-striés en avant, un peu moins en arrière; interstries très légèrement rugueux. Dessous noir; épipleures des élytres et épisternes métathoraciques bruns. Pattes brunes.

Rejaf, juillet (A. F. J. Gedye). Muséum, Paris.

Diffère de *D. variolosus* par la forme moins parallèle; la ponctuation de la tête et du pronotum fine, égale et serrée.

*PARACARDIOPHORUS*, Schwarz, 1895.

Génotype: *Cardiophorus musculus*, Erichson.

*P. RABAINUS*, n. sp.

3 1/2 à 4 mm. Oblong; noir brillant; pubescence grise. Tête peu convexe; ponctuation nette et écartée. Antennes fines, subfiliformes, ne dépassant pas la base du pronotum, trois premiers articles testacé pâle, les autres noirs; 2e plus gros que le 3e et de même longueur; suivants notablement plus longs. Pronotum plus long que large, arqué sur les côtés, rétréci en avant, peu convexe; ponctuation nette et

écartée; sillons basilaires courts, bien marqués; angles postérieurs courts, plats, assez larges, arrondis au sommet; limites latérales prolongées en avant jusqu'au delà de la moitié. Elytres faiblement arqués sur les côtés, rétrécis en arrière, arrondis au sommet, peu convexes, assez fortement ponctués-striés; interstries plans, à ponctuation fine et clairsemée. Dessous noir. Pattes testacé clair.

Rabai, janvier (A. F. J. Gedye). Collection Fleutiaux; Masaka, février (A. F. J. Gedye). Coryndon Memorial Museum, Nairobi, Kenya Colony.

Jolie petite espèce, plus courte que *P. elgonensis*, Fleutiaux; corps entièrement noir; pronotum à peine rétréci en arrière; ponctuation égale et écartée; élytres relativement plus courts. Voisin également de *P. liliputanus*, Fleutiaux; même aspect noir brillant; élytres plus fortement striés; pattes entièrement testacé pâle.

*TROPIDIPLUS*, Fleutiaux, 1903.

Génotype: *T. tellinii*, Fleutiaux.

*T. MOMBASANUS*, n. sp.

5 mm. 1/2. Oblong; tête et pronotum noirs, élytres bruns; pubescence grise. Tête peu convexe; bord antérieur arrondi; ponctuation assez forte, peu serrée. Antennes grêles, testacées, n'atteignant pas la base du pronotum; 2e article un peu plus court que le 3e; celui-ci légèrement plus long que le suivant. Pronotum aussi long que large, sinué latéralement, largement arrondi en avant, un peu rétréci tout à fait en arrière, très convexe, brusquement déclive à la base; ponctuation formée de points espacés et de points fins dans les intervalles; sillons basilaires nuls, remplacés par une fine carène oblique assez longue; angles postérieurs aplatis, non divergents, carénés près du bord externe; limites latérales entières. Elytres parallèles, arrondis en arrière dans le dernier tiers, convexes, striés-ponctués, moins fortement sur le dos; interstries finement pointillés. Dessous noirâtre. Pattes brun clair.

Mombasa, avril-mai (R. E. Dent). Collection Fleutiaux et Coryndon Memorial Museum, Nairobi, Kenya Colony.

Diffère de *T. turkanus*, Fleutiaux, par la forme plus courte et plus large, les élytres bruns, plus profondément striés.

Gén. *MOPLEONUS*, n.

Une certaine confusion règne parmi les insectes placés d'abord par Candèze (Mon., 1863) dans le genre *Pleonomus*, Ménétries. Il en a plus tard (Catal. method., 1891) séparé quelques-uns sous le nom inédit de *Nomopleus*. La même année, Reitter (Cat. Col. Eur.)

indique le genre *Nomopleus* pour *strictus*, Candèze, d'Espagne (laissé par l'auteur dans le genre *Pleonomus*). C'est seulement en 1905 (Best. Tab.) qu'il l'a décrit comme sous-genre d'*Athous*, pour *elongatus*, Brisout, 1866, également d'Espagne, auquel il rapporte *strictus*, Candèze, 1863 (sub *Pleonomus*). Schenkling semble avoir donné la priorité à Candèze, puisqu'il a changé le nom de Reitter en *Neopleonomus* (Col. Catal.).

Le nom de Candèze, non décrit, s'applique à un groupe hétérogène d'espèces qui devront sans doute être réparties ailleurs<sup>(1)</sup>. J'ai moi-même fait entrer dans le genre *Nomopleus*, Candèze (Voy. All. et Jeann., 1919)<sup>(2)</sup> deux espèces qui me paraissent constituer un autre genre sous le nom de *Mopleonus*, avec *Candezei* comme génotype :

Corps oblong. Mandibules saillantes, falciformes. Front étroit en avant et abaissé au niveau du labre; crêtes susantennaires caréniformes. Antennes épaisses, dépassant la moitié du corps; 2e et 3e articles petits, globuleux, égaux. Limites latérales du pronotum effacées en avant; angles postérieurs non carénés. Elytres sub-parallèles, arrondis vers le bout. Prosternum sans mentonnière; sutures prosternales dédoublées. Hanches postérieures étroites en dehors, brusquement élargies en dedans. Pattes épaisses; tarses simples; griffes simples.

Se place dans le voisinage du genre *Pseudonomopleus*, Fleutiaux.

*M. NOVUS*, n. sp.

8 1/2 à 9 mm. Oblong, assez allongé; brun légèrement bronzé, plus ou moins ferrugineux à la base du pronotum et sur la suture des élytres; pubescence grise dressée, mélangée de soies plus longues, surtout sur les côtés. Tête peu convexe, impressionnée au milieu en avant; bord antérieur abaissé au niveau du labre; ponctuation assez grosse, serrée. Antennes noires, robustes, filiformes, hérissées de poils jaunes, dépassant la moitié du corps; 2e et 3e articles courts, globuleux, égaux; suivants beaucoup plus longs. Pronotum à peu près aussi long que large à la base, faiblement et graduellement rétréci en avant, convexe sur le dos, brusquement déclive vers la base, limité latéralement seulement en arrière; ponctuation grosse, peu serrée au milieu, plus dense sur les côtés; angles postérieurs obtus, non carénés. Elytres un peu plus larges que le pronotum à la base, parallèles, arrondis seulement vers le bout, convexes, non distinctement striés, fortement et irrégulièrement ponctués. Dessous de même couleur. Propectus grossièrement ponctué. Prosternum large; pointe postérieure longue, parallèle, arrondie à l'extrémité; sutures canaliculées en

(1) Avec deux d'entre elles, j'ai créé le genre *Pseudonomopleus* (Bull. soc. ent., France, 1931, p. 29).

(2) *N. alluaudi*, Fleutiaux et *N. candezei*, Fleutiaux.



avant, aboutissant en arrière en dehors des hanches antérieures. Méta sternum à ponctuation moins serrée. Hanches postérieures plus étroites en dehors que les épisternes métathoraciques, notablement élargis en dedans près de leur bord interne. Abdomen à ponctuation peu serrée sauf sur le dernier arceau. Pattes noires, fousseuses, hérissées de poils gris, plus longs sur le dessus des tibias.

Nairobi, avril-mai (Dr. van Someren) (Type) Nairobi, 5450 pieds, avril (A. F. J. Gedye). Collection Fleutiaux et Coryndon Memorial Museum, Nairobi, Kenya Colony.

Diffère de *M. Alluaudi*, Fleutiaux, par la taille plus grande, l'aspect plus brillant et légèrement bronzé; ponctuation du pronotum moins large, plus profonde, moins serrée.

*M. SOMERENI*, n. sp.

8 mm. 1/2. Même coloration, même ponctuation, même pubescence que *M. novus*; mais de forme plus courte et plus large; antennes plus longues. Diffère notamment par la forme des branches latérales de l'organe génital ♂ qui sont droites, graduellement atténuées, à profil abaissé au sommet, alors que chez *M. novus*, elles sont plus minces, non rétrécies au bout, divergentes à l'extrémité.

Karura Forest, mai (Dr. van Someren). Muséum, Paris.

*LESNELATER*, n. n.

pour *Pachyelater*, Lesne, Bull. soc. ent. France, 1906, p. 173, ♂ ? (non *Pachyelater*, Lesne, loc. cit., 1897, p. 117).

Génotype: *P. madagascariensis*, Lesne, loc. cit. 1906, p. 174, ♂ (non Lesne, loc. cit., 1897, p. 102, ♀ ?).

Les deux formes décrites par Lesne sous le même nom sont tellement dissemblables que le doute est permis sur leur identité générique; d'autant qu'aucune observation n'est encore venu confirmer qu'elles représentent les deux sexes d'un même espèce, comme il l'a supposé. Pour éviter la confusion je propose de les tenir séparées.

Les espèces appartenant à la faune de l'Afrique orientale sont les suivantes:

*L. dubius*, Schwarz (sub *Cardiophorus*) (*Pachyelater Lesnei*, Fleutiaux).

*L. singularis*, Fleutiaux (sub *Cardiophorus*).

*L. unicus*, Fleutiaux (sub *Cardiophorus*).

Par leurs mandibules saillantes et leurs pattes fousseuses, ces insectes paraissent apparentés aux *Physodactytinae*.



*L. VICINUS*, n. sp.

6 mm. 1/2. Elliptique, allongé; noir opaque, élytres avec une bande ferrugineuse sur le côté, ne touchant pas le bord externe, moins apparente en arrière; pubescence grise. Tête convexe, déprimée au milieu en avant; bord antérieur saillant; ponctuation serrée. Antennes noires comprimées, assez larges, atteignant la moitié du corps; 2e article petit, globuleux; 3e beaucoup plus long, de même forme et moins long que le suivant. Pronotum plus long que large, arqué sur les côtés, rétréci en avant, convexe, brusquement déclive à la base, non limité latéralement; ponctuation serrée, moins sur le dos; angles postérieurs petits. Élytres arqués sur les côtés, atténués en arrière, fortement ponctués-striés interstries plans et rugueux. Dessous noir; pubescence grise. Fémurs assez gros, testacés; tibias et tarses plus foncés.

Lower Tana-Sabaki, avril-mai (Turner et MacArthur). Muséum, Paris.

Diffère de *L. unicus*, Fleutiaux, par la forme générale plus étroite; bord antérieur de la tête plus avancé, moins abaissé au milieu, plus tranchant; antennes plus fortes et plus longues; élytres plus longs, stries moins grossièrement ponctuées, interstries plans, plus larges et rugueux, bande jaune plus confuse; fémurs moins gros.

## IN SEARCH OF TELEKI'S VOLCANO.

My interest was first roused in this volcano by Mr. A. G. Baker, the late Director of Surveys, who said to me just as I was departing from Nairobi in 1928 on a safari to demarcate the Suk and Turkana boundaries: "By the way, though Teleki's Volcano is mentioned in the description of Provincial boundaries, we are not quite sure where it is or whether it still exists. You may be able to help us."

That he had some reason for saying this is borne out by a statement which appeared in the *Geographical Journal* of April, 1898, by Mr. H. S. H. Cavendish. It ran thus: "On arriving at the south end of the lake (Rudolf) I was surprised to find Teleki's Volcano had entirely disappeared, its place being taken by an entirely flat plain of lava. We got hold of some Ligob men who lived at the south end of Lake Rudolf, and within a couple of miles of the volcano, who told us that about six months ago the lake overflowed and as the waters rushed towards the mountain, the native name of which was Lubburua, there was a vast explosion, after which the waters swept in where the crater had been and put out the fire."

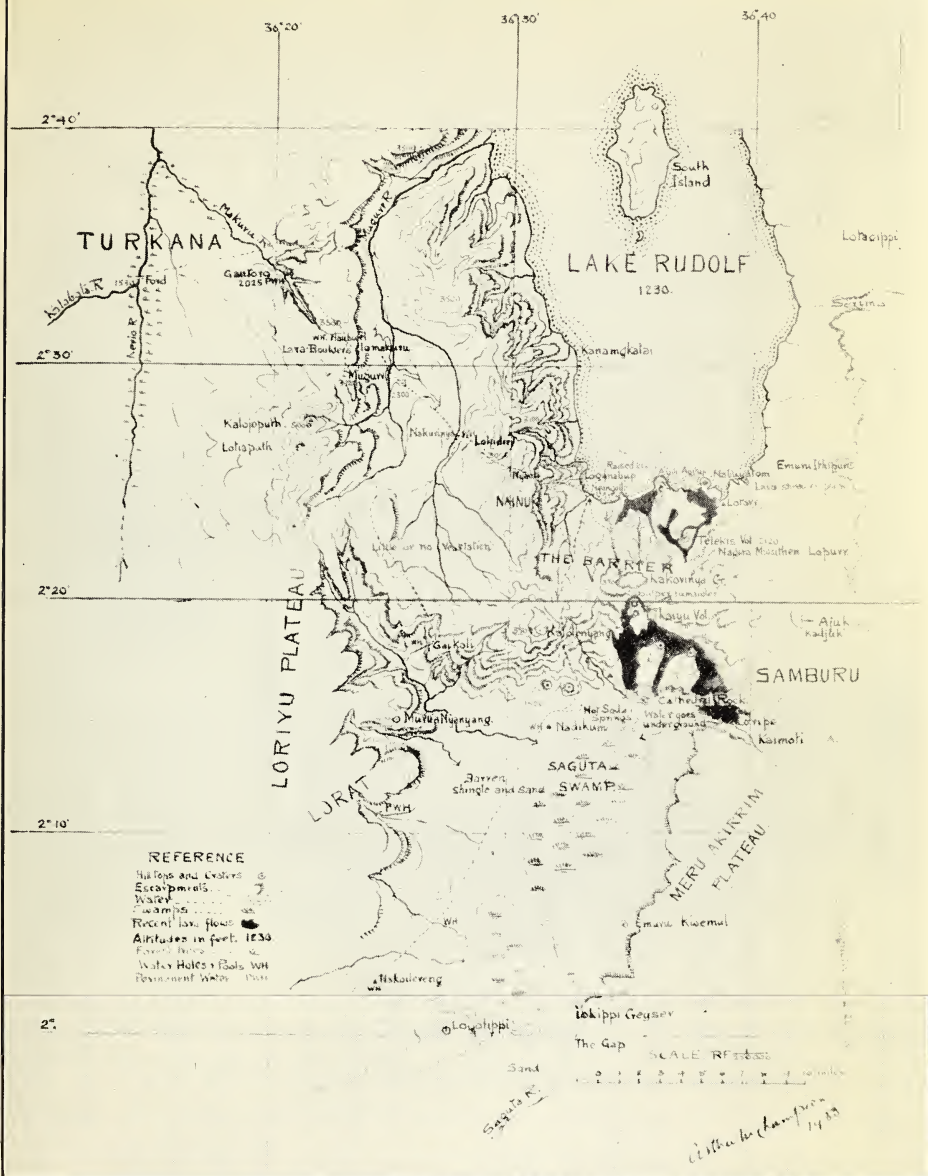
In addition, such a weighty authority as the *Enc. Britannica* informs us as follows: "Great changes have been reported since 1889. In particular the great Volcano of Lubburua (Teleki's Volcano) at the south end of the Lake is said to have been destroyed between 1889 and 1897 by a sudden explosion"

As it turned out I did not reach that region at all on that trip, and so the position and existence of Teleki's Volcano remained an uncertainty.

Some years later I returned to the Turkana Province and determined to seek an opportunity to unravel the mystery, and with this object in view I set out in April of 1931 with Mr. Baker Beall, the District Commissioner of Southern Turkana, and Dr. Robertson, the Medical Officer at Lodwar.

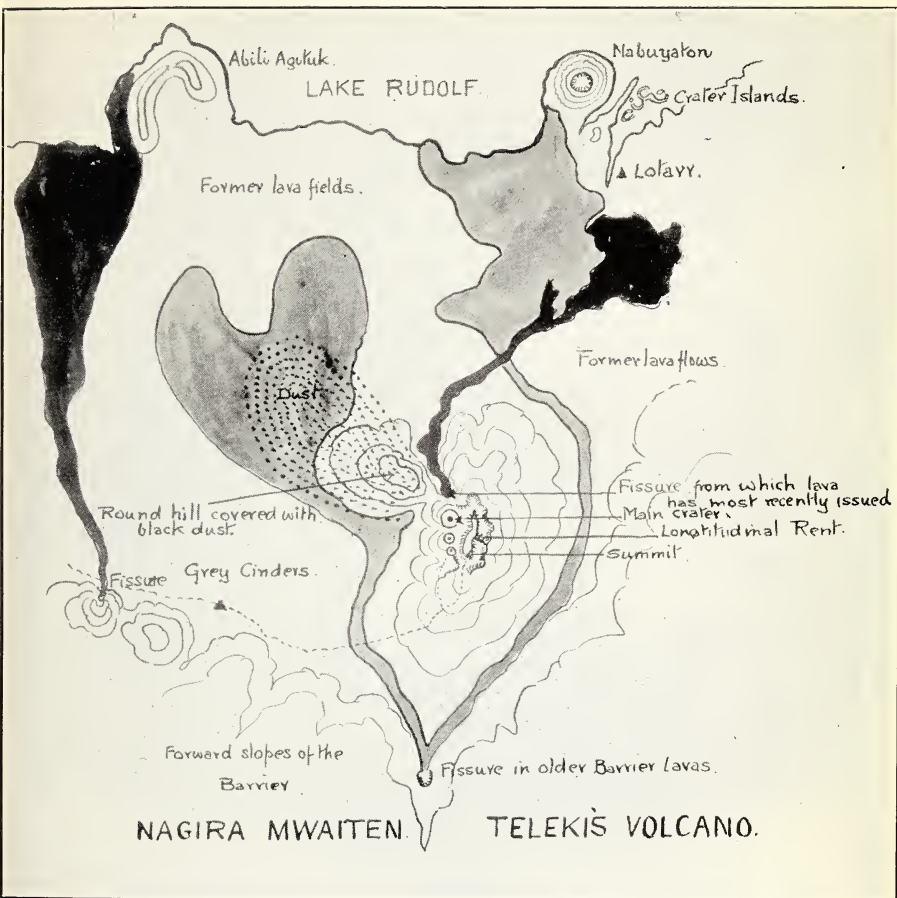
We had, unfortunately, none of us studied the literature of the area or we might have saved ourselves very much trouble. The existing maps were so lacking in detail that they were of little or no assistance. As the name implies, the original discovery of this volcano must be attributed to Count Samuel Teleki, that redoubtable and undaunted explorer who, accompanied by Von Hohnel (who is still alive), left Zanzibar in 1886 with a safari of 500 porters and returned three years later with the news that he had discovered a volcano and two lakes. The former was named after himself whilst the Lakes Rudolf and Stephanie were called after the Crown Prince and Princess of Austria. Only 200 of Teleki's porters returned and his adventures make wonderful reading. His dogged determination and courage are perhaps only equalled in a similar field by those of General (then Major)

## SOUTHERN RUDOLF AND TELEKIS VOLCANO











H. H. Austin who, eleven years later, made that wonderful trip from Khartoum to Mombasa. The volcano when discovered was in such a condition of thermal activity that Teleki had perforce to make his way round the southern end as he could not cross the flow of molten lava which enveloped its northern and eastern sides and extended for a distance of about five miles to the shores of the lake. Whilst his caravan was making this arduous detour, he made an attempt to reach the summit, but was driven back by the fumes and gigantic cracks, both of which made further progress an extremely hazardous undertaking.

The only natives whom he mentions as living in the neighbourhood, but not in the close vicinity of the volcano (which was uninhabited), are the Lokob, who appear to be the fisher-folk of several tribes from the area lying to the east—in fact paupers or El Molo who, owning no stock, were driven to seek a living by fishing, and the Bukenedji, who are undoubtedly the Samburu. I do not know if this name is still in use for the tribe, or perhaps for a section only. The area was visited by Capt. Welby in 1899 when the volcano was apparently quiescent. A lava flow which he describes very graphically, he considers from the condition of trees which had been overwhelmed by it, to have been formed only about three or four years before. Still later, Lord Delamere in 1900, and Capt. Stigand in 1912, I think traversed this area, but neither, as far as I am aware, make any mention of the volcano.

In 1917, however, Mr. Deck, when travelling in the Samburu country, tells me he distinctly saw black smoke rising from that neighbourhood, but was unable at that distance to say if it came from the north or the south side of the barrier which divides the Suguta from Lake Rudolf.

Mr. Juxon Barton, who in 1921 and 1922 was travelling in Southern Turkana, informs me that the natives brought him terrifying stories of a mountain of fire, and that he saw a glare at night which gave support to their story. So much for the history of the volcano.

Setting out from Lodwar, the Government Station for Northern Turkana, I joined my two companions three days later at Ndiki on the Kerio River. Our combined safari amounted to 30 camels, of which eight were carrying water and the rest only half loads. We could thus carry about 160 gallons of water, which would give us three days' supply.

Leaving the Kerio, in which there was a little water flowing, we struck south eastwards for a re-entrant in the long horizon of the Loriyu plateau which forms the watershed between the Kerio and Suguta Valleys. On entering the gorge the floor was found to consist very largely of detrital material from the basement complex which east of the Turkwel had been covered by a thick sheet of lava. At

Gautoro, where we rested for the remainder of the morning, we were fortunate enough to find water in some holes in the river bed. Here the junction of the overlying lava, an olivine basalt with the basement complex, was well exhibited. Soon after midday, all receptacles capable of holding water being filled, we ascended by a rugged path up the southern side of the valley and found ourselves on the edge of the boulder-strewn plateau. We set our teeth against a strong and never-ceasing wind which blew dust and gravel into our faces, and even caused the Turkana to use their forearms as protection. There was no soil: it had all been blown away into the Kerio Valley below and progress was only achieved by hopping from one big boulder to another. By nightfall the beasts were tired out and many were suffering from strained and bleeding feet. Early next morning we stood on the edge of an escarpment of about 500 feet, looking down into the parched valley of the Mugurr River. As we descended the escarpment, an excellent example of the successive and parallel fault lines of the Rift Valley was exhibited, and at the foot we found ourselves again on the Gneisses and Schist of the basement complex.

Here we made a great mistake, and instead of continuing our easterly course, we allowed ourselves to be deflected south by our advisers who, after the manner of African guides, assured us of the insuperable difficulties along the direction we wished to take. Making our way as directed, we traversed broken country, where we found ourselves back again on the basalt and volcanic tuffs. The presence of water in a rock pool induced us to stop there for the night and make an extra early start next morning. This we did, and stumbling over boulder-strewn country, made a circuitous course to Gaikali. Here we had our first view of the Suguta Valley, which was shimmering in the heat and mirages of the midday sun. Rather late in the afternoon we started on the descent, and as we got down, so we began to see the southern slopes of the natural barrier which dams the Suguta Valley. They were covered with volcanic cones in all stages of disintegration. One of the party said: "That looks just like the moon through a telescope." He described it well, and very beautiful and striking the scene was as it lay bathed in the light of the setting sun. One detached mass, standing like an island in the golden sands of the Suguta, immediately arrested our attention, for we thought it must be the volcano of which we were in search. Closer examination through glasses proved this to be improbable. The horizontally stratified brown and yellow tuff of which it was composed had, under the agency of denudation, been so modelled as to impart to it the appearance of a gigantic Gothic pile. We therefore dubbed it the Cathedral Rock. Darkness fell upon us before we had reached the bottom, and as a report was brought in that the camels carrying the water were too exhausted to proceed further, we camped on the spot.



The next morning, an hour's march brought us to Nadikum, where was a little spring of fresh water under some dom palms, which seemed to be the sole representatives of the vegetable kingdom in these parts. Between us and the Cathedral Rock extended a sea of mud and water inhabited, as far as I could ascertain, exclusively by flamingo. The wrack at the edge, representing a high water mark, was composed largely of their quills, as well as the skeletons and bones of a fish, which Mr. Dent has kindly identified for me as *Tilapia nilotica*. An attempt to cross this quagmire nearly ended disastrously. A specimen of the black slime, which underlay a yellow brown scum, contained such a high percentage of soda that it was found to have corroded through the tobacco tin in which it was placed, before the end of the trip. Baker Beall decided to strike off northwards over the barrier whilst the Doctor and I preferred to make an examination of the southern slopes of the barrier. We first of all skirted along the northern edge of the swamp, where we came on numerous hot springs, until, under the shadow of a high cliff over which hung a cascade of black lava, we found the spot where the Suguta disappears underground. Whether it hereafter pursues an underground course to Lake Rudolf or not I am unable to say, nor did I ever find any evidence of it coming to the surface again.

The black lava we found to be an olivine limburgitic basalt of very recent origin. It rested on the rocks which composed the barrier. They had the appearance of *Trachytes* and *Andesites* of intermediate age.

We pitched camp, and after tea walked up the slopes of the barrier in the hope of being able to ascertain the origin of this field of black lava. We had not proceeded far before we saw, perched high up on the slopes, a cone-shaped heap of yellow and black cinders. It was too far off to reach that evening, so we decided to tackle it the next day. It proved further than we thought, and several big detours had to be made to avoid deep and precipitous gullies. As we approached our objective, we noticed the bare hard ground began to be sprinkled more and more thickly with black lapilli. Interspersed were volcanic bombs, from a hen's egg to a football in size, lumps of molten rock ejected with violence and flung some 1,000 yards or more from the crater. It was lying as if it had but recently fallen and not blown into heaps into protected places, and on examination proved to be sharp and angular. It first made its appearance about one mile from the cone, and became thicker as we approached. Eventually a lava flow about 300 yards wide separated us from the base of the cone. This was very jagged and rough with numerous spiracles and steam holes, quite unweathered and without the least trace of vegetation. On gaining the other side we found the lip of the cone about 150 feet above us. The crater was elliptical with its longer axis oriented north

and south, and contained two if not three distinct vents. Detrital material had, however, fallen back from the inner walls in sufficient quantities to choke the throats. There was no thermal activity beyond a slight sense of heat, a few sulphur fumaroles, from which fumes may still have been issuing, and a number of steam vents dotted about the country side. At the S.-W. edge of the crater lip a large breach had occurred and from this had issued the black lava, which had poured over an area estimated at between 12 and 15 square miles, lying to the south and south-east of the cone. The inner walls of the crater were hung with chocolate coloured stalactites of clinker. To the north lay another crater which had been completely shattered, evidently by an explosion. It was situated a little too far away, and had evidently been of too large proportions, to be correctly termed a parasitic cone. A mile north of this and we found ourselves standing on the edge of a large crater, perhaps a mile across. It was obviously very much older than those we had just left. The inner walls were precipitous and in the form of a circle, slightly breached on the southern side. The floor was 200 to 300 feet below the lip, flat, and with a thin covering of scrub. From this point we had an excellent, if somewhat distant, view of the geyser at Lokippi, nestling under the Samburu Escarpment.

We returned to camp in the evening, quite convinced we had rediscovered Teleki's Volcano.\* The next morning Baker Beall came back, having reached the lake shore the evening of the day he set out. The next he spent exploring and had met Turkana, who supplied him with some fish and stories of the past. He gave a wonderful description of the lava flows along that rugged shore and of a big cone which stood on the end of a peninsular of lava running out into the lake. He did not think, however, that it was of recent origin and therefore could not be the volcano Count Teleki had found in eruption. In fact he had not spotted the real volcano any more than Cavendish had thirty-four years before, and for the same reason, which will be explained later. His photographs, when developed, proved beyond all doubt the relative antiquity of the cinder cone he had seen.

A month or two later I managed to get the loan of a copy of Von Hohnel's work, and from the description contained therein was convinced that neither the cone described by Baker-Beall nor the one examined by Robertson and myself could be the volcano which Teleki discovered in eruption in 1888: evidently Baker Beall had overlooked it, or, as Cavendish had reported, it had been wiped off the map. A few months later Baker Beall and Kennaway set off again in search of the elusive volcano. They travelled down the Suguta and visited the Lokippi Geyser, from which at regular intervals so vast a volume of

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\* From subsequent reading, I feel sure that it was the one discovered by Cavendish and called Andrew Volcano after his companion.

boiling water surges to the surface, that it gives quite a new lease of life to the river, which at that point had almost ceased to flow.

They then proceeded over the barrier, and Kennaway soon spotted the volcano and was, as far as I know, the first European to reach the lip of the crater. An injured foot prevented his companion from accompanying him. He returned with some excellent photographs and a detailed plane-table sketch, not only of the immediate area but also of the Suguta to the south, and that intricate country along the south-west coast line of the lake.

It was not till August of last year, however, that I could spare the time to visit such distant parts again. This time, providing myself with a theodolite and a plane table, I was able, by an extension of the Kenya Triangulation, to fix with sufficient accuracy a few major points in the vicinity on which to tie the plane table sketch accompanying this article. The whole may be subjected later to some adjustments for longitude and latitude. I refused to be deterred from following the direction I wished—for I was sure it was more the Turkana fear of the devils which haunted this land of fire and smoke, than the difficulties of the route, which had prompted them a year before to lead us off to the Suguta in the hopes that we should be contented with a view of the less evil-omened geyser.

Leaving my camels behind in the Kerio, I made my way across the Loriyu Plateau with four donkeys and a mule, and by five o'clock next evening was standing on the eastern edge of the Plateau, evidently at the very spot at which Teleki had forced his way up by a path so steep and rocky, that the donkey carrying his pet monkey, Hamus, had lost his footing and fallen over the side. We, too, had a rough descent, man-handling the loads and pushing, pulling, and belabouring the unwilling beasts. From the brink of this precipice a truly wonderful panorama of African landscape is unfolded. It was evening, and the sloping rays of the sun projected a deep shadow half way across the silent surface of the lake, which lay 2,000 feet below. From the opposite shore and out of a plain of lava, volcanic mountains rose in tiers, cliffs and plateaux characteristic of the greatest physical feature of the continent, to a distant horizon where the double peak of Kulal pierced the deep blue sky, the remnants of a once mighty volcano. A sandy beach below curved round to the southern shore, deeply indented with capes, bays, and promontories, and on the end of one was perched, like a gigantic mole hill, with all its symmetry of contour, the cone Baker Beall had described so well. Other cones of lesser size and perfection of shape seemed to pierce this dark field of lava, thrown like a black mantle over the lower slopes of the barrier. A high water mark was clearly visible at what appeared to be a uniform height on several of these cones, and from a rough calculation appeared to be about 250 feet above the present water level. To the



right, just as the northern slopes of the barrier begin to steepen, two round black hills, back-grounded by the lower slopes of Mt. Nyeru, were just discernible. The top of one I could see through the glasses was coloured red, yellow, and green, and I could make out a small but very well-formed crater. This surely could be none other than Teleki's Volcano, and so it proved to be. But for the strong sunlight behind me I also might have overlooked it, as Cavendish and Baker Beall had done.

After passing the night on a rocky ledge half way down, the descent was continued next morning to about 300 feet above the lake, where the remains of a raised beach were found, but in spite of as thorough a search as time permitted, no trace of fossil remains were seen. Just before reaching the foot, the junction with the basement complex was again encountered, and looking northwards along the cliffs I could very plainly see the characteristic moulding of the Gneisses and Schists, extending eventually almost up to the top of the Escarpment. North of the mouth of the Mugurr River the dip causes these beds to come to the surface, and the lava cap, which is such a characteristic feature of the Loriyu plateau, gives place to the more broken features associated with the archæan rocks.

On gaining the water's edge, men and beasts slaked their thirst, and we followed along the grey sandy beach which I had observed from above, to the mouth of the Neangoil River. A solitary Grant's Gazelle scurried away on our approach, but bird-life was more abundant. A Goliath Heron was making his breakfast off a huge Tilapia, which an hour later found its way to my table; two pairs of lesser black-backed gulls, a pair of Egyptian geese, a pelican, and an egret or two were seen. Stint, sandpipers, curlews, plovers, etc., so common on the sandy shores of the lake elsewhere, were entirely absent. The sand was composed of a mixture of volcanic and crystalline grains and the water's edge was here and there tinged with a delicate mauve, due to the presence of large numbers of minute shells, which I have not yet identified. The river has cut a deep channel into the deposits which, when the lake level stood much higher, were the shoals about its mouth. They consisted of a fine white mudstone of volcanic material in which stratification under current influence was very clearly visible. Beds of coarser material occurred from time to time recording the occurrence of exceptional floods. These deposits, which are probably of upper Pleistocene Age, are well exposed in the cliffs over 30 feet high, which form the banks, and may extend for a considerable depth below. With the exception of one fish vertebra no fossil remains were found. About 500 yards up from the present mouth, a lava flow has completely blocked the channel, and ends abruptly like the foot of a glacier. The lava is a compact warm grey basalt and is not of very recent origin. The lava stream evidently flowed from some fissure which I could not detect, high up on the northern slopes of the barrier.



After a midday rest in the welcome shade of some dom palms in the river bed, and a chat with some of the inhabitants whom I found to belong to the Engebelai Section of the Turkana,\* I set out in the direction of Teleki's Volcano with only three natives and a pack mule. About two miles inland I struck some horizontal shelves of rock, which proved to be raised beaches in which shells were very closely packed together. The beaches were about 250 feet, by the aneroid, above the lake level. For an hour or more our way lay through typically volcanic country, across lava flows of various ages and in different stages of weathering; vertical walls often marked their edges. A local Turkana guided me for the first two miles, then showing me the best direction, gave me his blessing and departed. I had, therefore, to find my way as best I could, and about 5 p.m. we found ourselves at the northern foot of a large round hill, which was rent in two, and appeared to consist of concentric layers of red clinker, and from a fissure at the base had recently issued a large volume of ropy lava, which, as far as I could see, extended to the lake shore. We experienced some difficulty in crossing this. On the other side the ground was covered in a thick layer of grey cinders, which crunched crisply under the feet. There were a few leafless trees, which appeared to be quite dead, and an occasional tuft of coarse straw-like grass. The volcano was now about a mile to the east and I hastened to take a photograph before the sun was quite off it.

Rising with the first signs of light, I awoke my recumbent companions, two of whom protested that the devil had entered their bones so that they could even stand up. So, with only my Bugisho garden boy carrying the survey instruments, and hung about with the other impedimenta, I set out towards the volcano. At the foot a stream of very recent lava, some 80 yards wide, lay across the path, and after crossing this, which I found to consist of black limburgitic basalt with small crystals of olivine, the ascent of the cinder cone commenced. Four open pipes were met with about half way up. These varied from 3 to 6 feet in diameter. Viewed from above they suggested the inside of a factory chimney. They had formed neither cone nor crater and appeared to be bottomless.

A V-shaped gap seemed to indicate an easy line of ascent, and here I noticed signs of vegetation in the form of a bush with a delicate cream-coloured flower, kindly identified by Miss Napier as *Caparis galeata*, and which is to be found growing amongst the coral rag cliffs on Mombasa Island. I soon gained the summit, which consisted of a light chocolate and ochre coloured clinker, the colour being due, I think, to the sublimation of mineral gases, probably ferric chloride and sulphuretted hydrogen. A number of grey volcanic bombs lay around, but

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\* They stated that the Samburu no longer live on the lake shore. These Turkana keep a few goats, but live mostly on fish and dom palm nuts.

they were neither as big nor as numerous as those round the Likaiyu Crater. The position was soon fixed, and the altitude found to be 2,120 feet above sea level and 890 feet above lake level, which I have accepted at 1,230 feet. The volcano itself stood approximately 200 feet above the normal level of the ground on the south side, and 300 feet on the north side, or lake side. From this position I noticed that I was standing between two V-shaped rents\* two hundred yards in length and perhaps 60 feet in depth. Their longer axes were oriented approximately north and south. The outer edge of the eastern one had the appearance of the lip of a crater, but the outer edge of the western one was very broken. In fact the whole area occupying the summit of the hill reminded me of nothing so much as the more devastated portions of the battlefields of France. The inner walls were lined with chocolate-red clinker. The outer slopes were of grey cinders which slipped away from under the feet as one walked. The whole was elliptical in shape. I paused a while to look at the view which lay before me. Far away to the north could be seen the faint outline of South Island† set in a wide expanse of deep blue water. On the foreshore some five miles away at the end of a stream of lava which seemed to issue from under my feet, stood the cone of Nabuyatom which in Turkana means "Place of the war horn," from here as elsewhere a conspicuous feature of the landscape. On the left stood the great escarpment which I had descended two days before, and some fragmentary cones and curious boil-like hills lay scattered like islands in a sea of rugged rusty-looking black lava. To the north-west, and not 500 yards away, was a most curious phenomenon: a large mound covered with a thick coating of fine jet black volcanic dust. It seemed to me that there was a slight depression on the top. Its summit was apparently 100 feet lower than the spot on which I stood. This volcanic dust not only completely covered the mound but extended for about a mile beyond, with an average breadth of about 800 yards, and effectively smothered all the minor surface features like a carpet of black velvet. The wind had evidently been from the S.-E. when Teleki's Volcano had shot dust into the air. Far away to the north-west was Kulal, the home of the Rendili, whilst nearer were the eastern walls of the Rift standing back a little from the shore and gradually merging into the foot hills of Mt. Nyeru; behind, the steep slopes of the barrier, rising to some 3,000 feet or more, afforded a near horizon, shutting out any distant view in this direction. Here, however, lay a point of great interest, for in a small

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\* The name of the volcano in Turkana is Nagira-Mwaiten, which means place that is split in two.

† This island might well be named on our maps Von Hohnel's Island as a small compliment to the man who first put it on the map of Africa, and by whose careful notes and observations when accompanying Count Teleki added so much to our geographical knowledge of this region.

valley at the foot of the older lavas was to be seen an orifice or fissure from which great quantities of lava had obviously welled up and flowed on both sides of the volcano. It was this flow, which was then molten, which had so hindered Teleki in his attempt to approach the volcano. One arm had followed down a valley on the eastern side of the cone, and about a mile and a half north of where I stood, opened out and formed a large lava-field which extended to the lake shore. The other, after being deflected by the large black mound described above, opened out into two pear-shaped fields about a mile in width and perhaps two miles in length, and did not, as far as I could see, extend as far as the lake-shore. The former flow was crossed about a mile to the north by a light grey stream of lava, obviously of still more recent date. From my position I was unable to determine the point from which this last flow issued. Whilst looking through the glasses for Count Teleki's Camp at Lotarr, I could see a number of lagoons which suggested a group of submerged craters, and the idea has since struck me that a slight rise in the lake level about thirty-five years ago might have caused the water to flow into one of these and given rise to the story which the natives told to Cavendish.

I then made my way round the eastern crest and striking some deep and unpleasantly broad crevasses on the northern cinder slopes, decided not to continue my attempts from this side to approach what I could see was a well-formed crater, but to work down the forward slopes on to the light grey lava stream below. This I succeeded in doing and found the flow to rest directly on the grey cinders. The edges stood up in a wall from 4 to 8 feet in height and were rugged black and highly vesicular. The centre was grey in colour, very ropy, and with a texture rather similar to thin glue. It splintered under foot, and one had to proceed with caution, as huge steam cavities, some exploded and exhibiting great yawning chasms, others intact like gigantic bubbles, were of very common occurrence. These chasms were armed with the most formidable looking spiracles of jagged lava capable of inflicting the most unpleasant wounds on those unfortunate enough to fall in. As one stood in that complete silence one could hear the crackling of the lava all around. My companion was too terrified to pose in one of the steam holes which I wished to photograph. Following up this flow to its source it was found to emanate from a basal fissure on the N.-W. side of the cinder cone and not from the crater, on the lip of which I found myself standing a few minutes later. This I reckoned to be 120 feet from lip to lip with an inner wall of loose material standing at the natural angle, and at the bottom of this perfectly circular basin was an open pipe about 40 feet across, and judged from stones thrown into it, apparently bottomless. The sides of the pipe, as is seen from the accompanying photograph, are hung with red clinker with almost stalactitic structure and have been worn



smooth by the passage of the material blown up through the pipe. I formed the opinion that it was from this pipe that most of the dust, cinders, and clinker which lay around had been ejected and possibly the bombs, whilst the magma which forms the vast majority of the ejected material of which these extensive lava-fields are composed, would appear to have welled up with little or no violence from the two orifices which I had just seen, and that the one I had just examined must have opened and exuded lava since Count Teleki's visit. Working southwards I passed two more pipes of smaller dimensions but of exactly similar structure. Here I joined up with my tracks of the early morning and so completed the tour of the volcano. From most of these pipes, though fumes, possibly of carbon dioxide and sulphuretted hydrogen at a high temperature, were issuing, on the occasion of my visit they caused no inconvenience. I saw no sign of either smoke or steam. The discomfort, however, which I experienced during the latter part of the morning could not, I feel sure, have been due entirely to the heat of the sun. The rapid accumulation of geological specimens and their weight, added to the other impedimenta which I was carrying, may, of course, have led me to be mistaken in this. The camp at the Neangoil River was reached that evening in time for a refreshing bathe, and it was with a feeling of the utmost relief that the Turkana the next day ascended by Teleki's cliff path on to the Loriyu Plateau, where the appearance of a lonely camel carrying fresh water from the Kerio was hailed with great joy. The alkaline water of the lake, though at first not too unpalatable, soon becomes most nauseating, and is especially disagreeable when served with tea.

I do not propose to dwell at any length upon the extremely interesting physiographical theories which are prompted by travel in these regions. A glance at the map, however, suffices to suggest that the deeply sunken trough in the Great Rift Valley, which it represents, may once have been covered by a single sheet of water and that south of Von Hohnel's Island there existed yet another island or group of islands where the barrier is now situated. There is no reason to suppose that such islands were different in origin from those now found in the lake, and may have consisted of one big island-crater a mile or more across. From this gigantic opening in the crust of the earth, enormous masses of molten rock were ejected, and spreading east and west, formed the barrier now separating the Suguta Valley from Lake Rudolf. The more recent origin of the Trachytic lavas and Andesites, of which it is composed, and the existence of the very big crater in the middle, lend support to this theory. Zoological evidence in the form of the presence of *Tilapia nilotica*, a fish believed to be foreign to other Kenya lakes, in the Suguta Swamp, as well as Lake Rudolf, would seem almost to confirm it. An examination of





Traversing the Lorigu Plateau.



The Likaiyu or Andrew Volcano with the shattered cone in front and the Suguta Valley in the distance.





On the lip of the Likaiyu Crater. Lava field in middle and Suguta River in far distance.



The raised beach 310 fet above present Lake level on the escarpment bordering the S.W. side of Lake Rudolf.

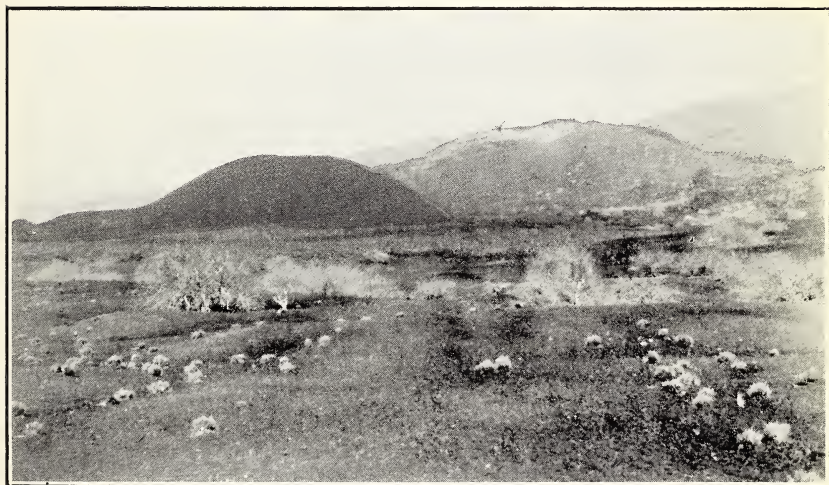






The lava flow blocking the channel of the Neangoil River.

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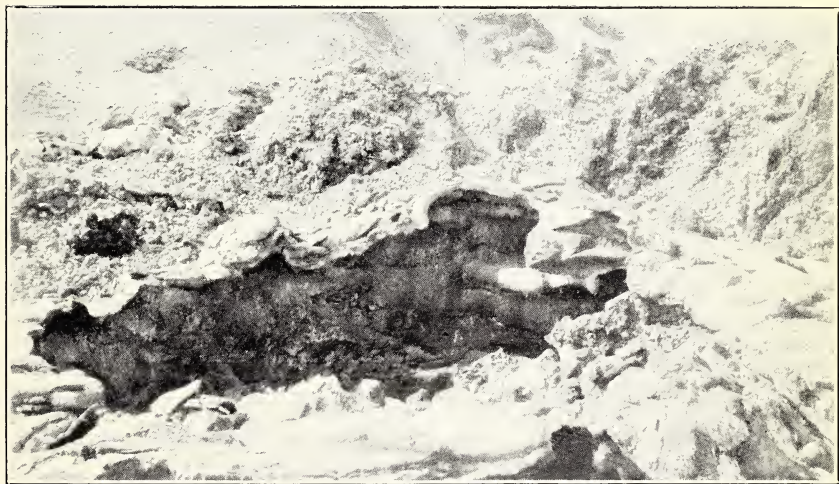


The Teleki Volcano from the west. Main crater marked by arrow.  
The dust-covered hill to the left. Foreground grey cinders.





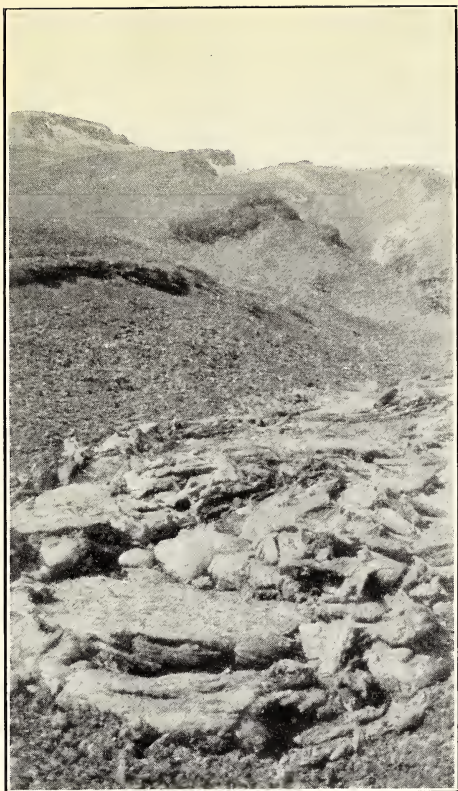
View from the summit of Teleki's Volcano. The most recent lava flow showing light in foreground, Nabuyalom in middle, and Von Hohnel's Isle in far distance.



An exposed steam hole in the most recent lava flow.







The most recent flow of lava, with Teleki's Volcano in the distance, showing the double rent down the centre of the summit and the crater on the right.



The pipe or throat of the main crater of Teleki's Volcano. Note how the opposite side is polished by the passage of ejecta. The portion out of focus in the foreground is the tip of the crater.



the volcanic rocks on the Samburu side would be enlightening: in fact, one may assume that further evidence only awaits discovery.

The Teleki and Likaiyu Volcanoes are perhaps but the dying remnants of an activity greater than any now existing in this region or elsewhere, but of which we have unmistakable proofs in many of the older mountain masses of Kenya. It would, however, be injudicious to assume that they are now extinct.

It is possible that activity has been prolonged by the continued sinking of the floor of the Rift Valley (e.g. the displacement along a line twenty miles in length from Solai to Baringo during the earthquake in 1928), causing a pressure on the magma below. This, as we have seen from an examination of the lava fields, has a high steam content owing perhaps to the percolation of lake water, which in contact with the internal heat of the earth and molten rock, renders the magma below particularly explosive. The superficial evidences of this power have been described as throwing bombs, cinder, and dust to a considerable height into the air. This relief is effected from time to time at points of weakness or least resistance in the earth's crust. These occur naturally along the tectonic lines of the Rift Valley and the orientation of these and other centres of present and past activity in relation to its general trend is very conspicuous. It is certainly no cause for surprise, for throughout Kenya volcanic piles such as Menengai, Longonot, and Ol Doinyo Nyuki (Suswa) are to be found on the floor of the Great Rift, and more often than not in close association with large expanses of water.

A. M. CHAMPION

# THE LIMESTONE CAVES AND HOT SPRINGS OF THE SONGWE RIVER (MBEYA) AREA WITH NOTES ON THE ASSOCIATED GUANO DEPOSITS.

By E. O. TEALE AND F. OATES  
(*Tanganyika Geological Survey*).

The limestone caves and hot springs of the Songwe River (Mbeya) region of Tanganyika Territory were visited by Dr. Dantz and briefly referred to in a description of his travels published in 1903<sup>(1)</sup>, but their existence was known to local missionaries before that date. A more detailed description was given in 1906 by Fülleborn<sup>(2)</sup>, who was accompanied by Kohlschutter and Glaunig.

Fülleborn refers to several caves in limestone and states that he explored one for a distance of one kilometre without reaching the end. As far as this point the cave was dry, but it was said by natives accompanying the travellers that there was a pool of water further in. Mention is made of the enormous number of bats inhabiting the caves, and of the deposits of bat-guano on the floors thereof. Thermal springs are said to occur at intervals for several miles along the western side of the valley, forming terraces of calcareous sinter some fifty feet or more above the bed of the Songwe. The temperature of one spring is given as 60° to 70° Cent., and an analysis of the water is quoted below :

Silica	...	...	...	...	0.065	parts	per	thousand
Lime	...	...	...	...	0.065	"	"	"
Magnesia	...	...	...	...	0.034	"	"	"
Chlorine	...	...	...	...	0.026	"	"	"
Sulphuric anhydride	...	...	...	...	0.169	"	"	"

The temperature of another spring is given as 43° Cent., and the composition as somewhat similar but containing more lime (0.105) and less sulphuric anhydride (0.094). The German name for the springs was "Gräfin Bose Thermen," the native name, "Maronde." It was said that the caves were used as refuge by the local natives when raided by the Wangoni. Fülleborn suggests that the caves, which may have served countless generations for protection, might yield valuable prehistoric treasures.

Recent interest has been attracted to the area by the "re-discovery" of the guano by Mr. L. E. Hickson-Wood, a settler of the Mbeya District, who is exploiting the material to supply a local market. The region was also visited by Mr. C. Gillman, Chief Engineer of the Tanganyika Railways, during his reconnaissance in



connection with railway surveys in the south-west highlands; more recently (1933) by Mr. G. Milne, the Soil Chemist of the Amani Institute; and in October, 1934, by the senior author.

#### SITUATION.

Taking the Mbeya Range as a reference, the main cave is situated near the village of Sukamawera on the west side of the Songwe River, twelve and a half miles west-south-west of Mbeya Peak, and eight and a half miles south of Punguluma, the north-western end of the Mbeya Range. (Map reference: F.3, 1:300,000, Long. 33° 13' E., Lat. 8° 54' S.)

Present access to the caves is by a bush motor-track, which leaves the Mbeya-Mbosi motor-road at a point eight miles west of Mbalizi and turns north-westward for four miles over the volcanic plain, at which distance the edge of the deep canyon-like valley of the Songwe and several of its tributaries are reached. Thence, a precipitous and rough motor-track descends some 600 feet to the Songwe and continues onwards to the caves, which are reached three miles further on, reckoned from the lip of the canyon. The hot springs occur at intervals along this stretch of the valley.

This section of the road constitutes a severe test for motor cars as well as for the nerve and skill of the drivers. At the time the caves were visited by the senior author, however, one-ton loads of guano were being hauled by motor transport up this astonishingly steep, rough, and sinuous grade.

#### GENERAL DESCRIPTION OF THE LOCALITY.

The scenic setting of the guano enterprise is a striking one, displaying wonderful variation in colour and tone according to the time of day and season. Viewed from the edge of the volcanic plain just before the observer descends to the Songwe Valley, the imposing mass of the Mbeya Range dominates the outlook to the north, its 9,525 foot peak a titanic sentinel watching over a landscape of the utmost variety, which has been moulded by a combination of tectonic, volcanic, and erosive agencies.

The surface of the plain upon which the observer stands consists of an accumulation of pyroclastic deposits partially filling in the southern end of the Rukwa Rift Trough and burying a down-faulted section of an ancient landscape, here composed in part of the red sandstones of the uppermost portion of the Karoo formation. The western view is limited by the Unyika Scarp, the edge of a fault-block associated with the tectonic movements of the Rukwa Rift region. The topographical relief is here accentuated by the canyon-like valley of the Songwe deeply incised along the foot of the scarp and in the volcanic plain. It is clear that the accumulation of volcanic material

has interfered seriously with the earlier course of the river and caused it to renew its activity, resulting in the carving out of its present chasm-like valley. Looking north-westwards down this valley one sees on one's right hand, cliffs and buttresses of sombre volcanic rocks capping deep red sandstones; on one's left hand, limestone cliffs flanked at intervals by snow-white terraces of calcareous sinter. In this direction the view fades into the blue haze of the Rukwa Trough, and into this relatively enormous depression the Songwe empties its contribution to a now vastly shrunken lake.

The route of the Imperial Airways Ltd., from Capetown to London, is above the area described in the present paper; thus the traveller by air is here able to view a most instructive section of the East African Rift features, which the air-route follows thence for hundreds of miles northwards.

#### GENERAL GEOLOGY OF THE AREA AND THEORIES AS TO THE ORIGIN OF THE LIMESTONE.

The detailed geology and geographical history of the region is as yet only very imperfectly known. A cross section from south-west to north-east reveals the following formation, starting on the Unyika Plateau:—

- (a) The basement complex of crystalline gneiss and schist.
- (b) Relics of the Karroo formation capping (a) and traversed by a north-westerly trending fault of the Rift period.
- (c) On the floor and east side of the valley, down-faulted members of (b) partially buried beneath pyroclastic products of tertiary vulcanism.
- (d) Tertiary volcanic rocks flanking the steep slopes of the Mbeya Range on the north-east.
- (e) The Mbeya *massif* consisting mainly of rocks belonging to the basement complex, but at the Punguluma end, of volcanic rocks of tertiary age in part silicified.

Flanking the Unyika Scarp for some miles in this region is a deposit of pink and white banded crystalline limestone which is of especial interest since its origin and age are still uncertain. It forms a horizontally disposed deposit of at least fifty feet in thickness and appears to be restricted to the western side of the Songwe Valley. Its banded and crystalline nature, like "cave limestone" clearly indicate origin by chemical deposition, but the source of the lime still remains a matter for speculation. Various views have been advanced as to the nature and origin of the limestone.

Dantz<sup>(1)</sup> suggests that it is itself crystalline limestone belonging to the ancient gneiss formation with the Karroo sandstones down-

faulted against it, the Songwe River following the line of fault. Gillman (private communication to the authors) refers to it as a tufa-like crust derived from extinct as well as from active thermal springs and attributes the source of the lime to lime-bearing silicate minerals in the underlying ancient rocks. A third possibility is tentatively suggested by Milne (official communication to the Tanganyika Geological Survey), namely, that the limestone may have been derived from basic tertiary lava and pyroclastic material rich in lime in the vicinity. Finally, should the underlying Karroo formation contain limestone or calcareous beds, appeal may be made to these as a possible source of the lime<sup>(3)</sup>.

The first of these suggestions is now no longer tenable since the horizontal banding of the limestone is clearly indicative of a young deposit produced by chemical precipitation, and this fact conclusively distinguishes it from typical Archæan marble. It was apparently overlooked by Dantz that the material *may* overlie the ancient marble as a secondary crustal deposit, but in any case marble has not been recognized in the general locality, so this possibility is somewhat remote.

The remaining views quoted above are at one in attributing to the limestone a secondary origin, and differ only in the conception of the nature of the primary source of the lime.

A striking analogy, which casts new light upon the problem of genesis, is afforded by a type of limestone from the Lupa goldfield strongly resembling fine-grained (saccharoidal) marble. This deposit occurs in the Chunya Valley, north of the Discum mine, and its geological association and lithological characters demonstrate beyond doubt that it is a young formation derived by chemical means from an amorphous freshwater limestone of Pleistocene age. In favourable sections the crystalline rock may be seen to occupy bands traversing the amorphous bedded rock due to solution and re-deposition of crystalline limestone in old subterranean solution-channels and cavities. Analyses of the Songwe limestone and of the crystalline and amorphous limestones from Chunya are supplied below for comparison:—

	(a)		(b)		(c)
	%		%		%
Silica and insoluble silicates ...	0.23	...	0.09	...	2.48
Ferric oxide and alumina ...	0.55	...	3.29	...	0.97
Lime (CaO) ...	51.80	...	53.56	...	51.68
Magnesia (MgO) ...	3.37	...	Tr.	...	1.63
Loss on ignition ...	44.04	...	43.21	...	43.11
	<hr/>		<hr/>		<hr/>
Totals ...	99.99	...	100.15	...	99.87
	<hr/>		<hr/>		<hr/>



- (a) Songwe limestone.
- (b) Chunya crystalline limestone.
- (c) Chunya amorphous limestone.

The purity of these three limestones suggests that the primary material from which (a) was derived must itself have been a relatively pure form of limestone. The secondary material from Chunya does not display such marked banding as does that from Songwe, but this feature is nevertheless present and is rendered apparent by ignition of the fine-grained sacchoroidal stone when it darkens and there appears a faint brown banding-effect due to formation of oxide of iron along such layers of deposition as are richer in iron than the average.

It is not known if a mode of formation similar to that just described would be applicable to the case under discussion, for beds of the primary amorphous limestone have not yet been recognized with certainty, although a specimen collected by Gillman at one of the thermal springs very closely resembles the primary type of limestone occurring in the Chunya Valley. It may be that a somewhat extensive lake, or chain of such, caused by the ponding action of barriers of pyroclastic material, existed at an earlier period at this point of the present Songwe Valley. Such barriers would eventually have been breached by the subsequent down-cutting of the river, and the lake system completely drained. The primary source of the lime may thus have been normal freshwater calcareous sediments since largely removed by erosion. The present distribution of the hot springs cannot alone account for the existence of this extensive and continuous bed of crystalline limestone; on the other hand Gillman (*loc. cit.*) considers that the sinter formation was formerly more extensive and that many hot springs then existed which are now extinct. Indeed, one may go further and conceive the former existence of a system of lakes such as that postulated above fed by thermal waters in which the precipitated calcium carbonate would have tended to form a stratiform deposit.

As regards the source of the lime, this might be accounted for from limestone, or at least calcareous beds, in the underlying Karroo formation, which would be penetrated by the uprising hot waters; or from later freshwater limestones of the earlier phase of Lake Rukwa; or simply from lime collected by the action of thermal waters penetrating lime-bearing rocks of any age.

#### THE "CAVE PEARLS."

An interesting feature of the hot springs is the occurrence in their proximity of small pisoliths or ooliths of pure calcium carbonate up to two or three millimetres in diameter. They are cream-coloured to pale flesh-coloured and usually spherical, though some have a rather



flattened form. They are soluble without apparent residue in dilute acid, and in micro-section display a delicate radial-concentric structure without observable, though possibly with sub-microscopic nucleus. These oöliths would seem to correspond with material to which certain American geologists have applied the somewhat fanciful name of "cave pearls" <sup>(4)</sup>. They have been recently described by the Tanganyika Geological Survey <sup>(3)</sup>. In this description it was stated that they were obtained by Mr. Hickson-Wood from one of the caves, but from information recently received from this gentleman it would now appear that they came from the hot springs. It is regrettable that no reliable statement is available as to their mode of origin since accurate observations as to the conditions under which they are forming should have an important bearing on the question of oölith-formation. A specimen of these "cave pearls" is to be seen in the geological museum at Dodoma.

#### THE GUANO.

The formation of the guano is principally due to the accumulation of the excreta of the countless bats inhabiting the caves. Their droppings upon the floors of the caves now amount to a considerable thickness, and interaction with the underlying limestone through the agency of downward percolating water has proceeded to depths of fifteen to twenty feet. The material shows great variability in composition and appearance: in general that near the surface, which is fresher and less highly leached, contains more nitrogen and less phosphorus than the average; while in the lowermost layers, where there is an increasing admixture with limestone, the reverse holds good.

The surface material is fresh, moist dung, and this gives place at shallow depths to a coarse brown powder, consisting of organic material, in which can be discerned abundant wing-sheaths of small insects interspersed with powder and small fragments of partly phosphatized limestone. At greater depths the material contains much less organic matter and is then a cream-coloured to pale brown, coherent but very friable, banded deposit, which may contain upwards of seventy per cent. of tricalcium phosphate. In general the guano is extremely moist and the following analyses were carried out in the Geological Survey laboratory on the material after it had been air-dried for several days.

#### PROXIMATE ANALYSIS.

		(a)		(b)
		%		%
Moisture expellable at 100° Cent.	...	9.8	...	10.6
Loss on ignition	... ..	34.5	...	24.9
Ash	... ..	55.7	...	64.5

# DETERMINATION OF USEFUL CONSTITUENTS.

Total nitrogen (N)	...	...	...	4.1	...	2.4
Total phosphoric anhydride ( $P_2O_5$ )	...	...	...	11.8	...	19.1
Water-soluble $P_2O_5$	...	...	...	0.4	...	0.6
Water-soluble potash ( $K_2O$ )	...	...	...	0.6	...	0.5
Lime ( $CaO$ )	...	...	...	14.3	...	7.0

- (a) Average sample of material in one cave from top to 16 ft. level.  
 (b) Sample from 16 ft. level.

According to Milne (*loc. cit.*) the caves lead from one to another through openings, some of which are mere manholes, and it is extremely difficult to estimate the quantity of guano available on account of the irregularity of the shape and conformation of the floors of the caves. There are certainly many hundreds of tons, possibly some thousands.

The percentages of phosphoric anhydride and total nitrogen compare very favourably with those of similar material from other localities in Tanganyika Territory, and this is illustrated by the following analytical figures kindly supplied by Mr. Milne:—

				$P_2O_5$	N
				%	%
Songwe River	...	...	...	11.8	4.1
Amboni, Sigi R., Tanga:					
Surface sample	...	...	...	0.17	5.2
Sample at 1 metre	...	...	1.6 to 2.0	...	0.3 to 0.6
Below 1 metre	...	...	...	2.0	1.4
Ukinga	...	...	...	5.4	10.2
Kilwa	...	...	...	5.9	5.4

On the whole the nitrogen-content is variable and low and the guano should be sold on its merits as a phosphatic fertilizer. It so happens that this is the important constituent since the local soils are notably deficient in phosphorus.

## CONCLUSION.

In conclusion it is desired to express regret that the limited time available for the geological examination did not permit the attainment of finality of investigation, but it is hoped that the entries made into the realms of speculation will be justified if they merely serve to stimulate further observation and enquiry in an area presenting many features of interest to the scientist and traveller.

LIST OF WORKS TO WHICH REFERENCE HAS BEEN MADE.

- (1) Dantz, Dr., Mitteilungen von Forschungsreisenden und Gelehrten aus den Deutschen Schutzgebieten, Bd. 16, pp. 144-6, Berlin, 1903.
- (2) Fülleborn, F., Das Deutsche Nyasa und Rovuma Gebiet, Dietrich Reimer, Berlin, 1906, pp. 473-6.
- (3) Tanganyika Territory Geological Survey Annual Report, 1933, Dar es Salaam, 1934, pp. 53-4.
- (4) Davidson, S. C., and McKinstrey, H. E., Economic Geology, Vol. XXVI, 3, p. 289, May, 1931, Lancaster, Pa. U.S.A.

# EAST AFRICA AND UGANDA NATURAL HISTORY SOCIETY.

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## ANNUAL REPORT, 1934.

### INTRODUCTION.

The year under review has not been marked by any sensational developments; it has been a year of steady progress despite adverse conditions.

There has been loyal co-operation between members of the staff, the honorary workers, and the Committee, resulting in a maintenance of the standard of development in all branches of our activities, proportionate to our financial resources.

Your executive Committee has been active throughout the year, and careful consideration has been given to all matters effecting general policy and expenditure of funds. Eleven ordinary meetings, and two extraordinary meetings were held, whilst the special sub-committees have met when required.

### FINANCE.

The financial position of the Society alters from year to year, and allocation of funds for any particular purpose is thus rendered difficult. The most stable item of income is that derived from subscriptions, and your Committee has followed precedent in expending this on matters connected with the Society, viz., the *Journal*, and not on the public exhibition hall.

Funds for the development of the Museum are derived from Government and the Municipality, and during 1934, £1,000 was granted. The Balance Sheet and Financial Statements now before the meeting will be explained by the Honorary Treasurer. It is gratifying to note in passing that expenditure was maintained below income.

### MEMBERSHIP.

The number of members has been satisfactorily maintained; new members taking the place of those resigning. We would, however, take this opportunity of urging the necessity of increasing our membership, and also of reminding members that the annual subscription falls due on January 1st. Prompt payment assists the Committee in framing the Budget, and there should be no item in the Balance Sheet representing subscriptions in arrears.



## JOURNALS.

One double number, representing Journals 49 and 50, was published during the year. Manuscript for a further number was in hand, but owing to a hitch in reproducing blocks, publication was held up. The cost of publishing the Journal is very high, and if we are to maintain our present standard, the number published in a year must of necessity be limited, or a special subscription called for.

## LECTURES.

Two evening lectures were arranged, one by Mr. Arthur Loveridge, and the other by Mr. A. M. Champion. Both were well attended and greatly appreciated. The annual two-day scientific meeting took place during November. It is gratifying to record the fact that contributions were received from both Uganda and Tanganyika so that the inter-territorial aspect of this annual function was maintained. We take this opportunity of recording our thanks to all those who submitted papers or otherwise assisted in the meetings. We were fortunate in having amongst us Prof. Boswell, Director of the School of Mines, London, and one of the Secretaries of the British Association. It is hoped that through his good services, the British Association will one day meet in Kenya and Uganda.

## MUSEUM.

It is now some four years since your Society undertook the task of conducting a public Museum in the Coryndon Memorial building. The task is no sinecure. Your Committee has endeavoured to develop the Museum on sound lines, paying due attention to the furthering of the study and systematic side as a basis on which to build up and draw upon for the public exhibition side. The prime importance of the systematic work cannot be too strongly stressed; the value of the exhibited material is dependent on the soundness of the work done in study rooms. It therefore follows that adequate equipment and facilities for this work must have first claim when funds become available. To steer a reasonable course between the rival claims has been a task which has confronted your Committee all along, and if members are inclined to criticise the development of the public exhibition hall, we must ask them to exercise patience and understanding. All donations made are not suitable for exhibition, and the selection of what shall be prepared as an exhibit and what shall remain as study material, must be left to the discretion of the Committee and the Curator. Furthermore, until the time arrives when a full range of furnishing is made available in the Museum, no real systematic arrangement on strict educative lines can be accomplished.

Grants-in-aid from Government and the Municipality are barely sufficient to meet the ordinary recurrent expenses in maintaining the Museum. An annual capital grant is a necessity.

We have pleasure in recording that the Society was invited to apply for assistance from the Carnegie Corporation, as a result of the report submitted to that body by the Museums Commission in 1932. A grant of £1,000 has now been made for the purchase of permanent exhibition cases and storage cabinets; the cases will be installed during 1935. We take this opportunity of recording our thanks to the Empire Grants Committee and the Carnegie Corporation for this much needed assistance.

A full range of special geological cases has been installed; these were purchased with the de Ganahl donation referred to in the annual report for last year, and contain an exhibit of economic minerals and geological material, largely loaned by the Government Mines Department.

As foreshadowed in the report just referred to, a start was made to the "Bongo habitat group" early in the year, and this exhibit was completed toward the end of August, and has proved a great attraction. Additions have been made to the Bird and Mammal exhibits as space has allowed, but no proper system can be adopted until cases are provided. Among the larger exhibits special mention must be made of two leopards donated by Mr. G. van Someren from Ngong, and a scaly manis presented by Count Donhof.

The monthly donations of materials have been well maintained; accessions have been particularly plentiful in the branches of entomology and botany. The donations made by Mr. Allen Turner are of special value. A valuable collection of birds was received from Mr. D. MacInnes from the Lake Rudolf area, also a representative collection from Njoro presented by Major Conduitt.

During the year, the Museum received as a donation the magnificent collection of mounted game trophies collected by Major Conduitt of Njoro. As most of the heads were extra-territorial species, a special exhibit was arranged in one of the small wings off the central hall.

The Botanical department has increased, more particularly in the systematic section, and is dealt with in the separate report prepared by the Botanist.

Systematic work in all branches is greatly assisted by the valuable help accorded by experts at Home. We wish to record our thanks to Sir Edward Poulton and Prof. Carpenter of the Oxford University, Sir Guy Marshall of the Imperial Institute of Entomology, and Sir Arthur Hill of the Royal Botanic Gardens at Kew.

Mr. A. F. J. Gedye and Mr. Allen Turner have again rendered valuable assistance in an honorary capacity in the Entomological Laboratories and other divisions.

Several scientific expeditions visited the country during the year and laboratory accommodation was extended to members of the Cam-

bridge Lake Rudolf-Rift Valley expedition, the British Museum expedition, and to Prof. and Mrs. Kirby of California University, U.S.A. Mr. Arthur Loveridge of Harvard again assisted in determining herpetological material during his brief visit to Nairobi at the beginning of the year

Public interest in the Museum is evinced by the number of visitors; well over two thousand were admitted, and as heretofore pupils and students (European, Asian, and native) have been admitted free and conducted round the exhibits.

#### LIBRARY.

Progress in the subject card indexing was brought to an unavoidable stop by the sudden resignation of the Librarian toward the middle of the year. The importance of this work can only be realised by those who make habitual use of the Library, and it is to be greatly regretted that funds did not allow of a new appointment being made. Journals and periodicals received in exchange continue to accumulate and space available is nearly exhausted. A further range of shelves will shortly be needed. We regret to state that negotiations towards the establishment of a Central Students' Reference Library have had to be abandoned for the time being, owing to some legal difficulty. The matter will, however, be reopened at the first opportunity.

## ANNUAL REPORT, BOTANICAL SECTION, 1934.

Expeditions were made to Mombasa and Kisii, and a day was spent at Lumbwa *en route* to Kisii. These trips, though partly financed by the Society, would not have been possible without the help of Mr. and Mrs. Fox and Major Buxton.

About 100 specimens were collected on each trip. Owing to the wet weather at Mombasa very few of the outlying districts were visited. From Kisii two days were spent in the little-frequented Lambwe Valley, where there were said to be some very uncommon and striking *Orchidaceae*. Unfortunately they were not in flower, but after much searching in very thick bush, leaves and roots were found; they appeared to be unlike anything in the herbarium, and it is hoped that they will flower in cultivation.

Owing to drought conditions local expeditions have not been very numerous.

The herbarium work has been progressing. A new cabinet has been filled and about half the duplicate specimens have been mounted, ready to make up into district series, or for use in the study of ecology.

Collections of fresh and pressed material have been received from : Lady Muriel Jex-Blake, Mesdames Albrechtsen, McKenzie, Le Blanc Smith, Hansen, Harries, Ritchie, and Ward; Misses Mainwaring, K. van Someren, and Jackson; Dr. van Someren, Messrs. Allen Turner, Gedye, A. Champion, Beckley, Hudson, C. van Someren, H. Parry, C. W. Harries, and C. Fox.

Thanks are due to all those who take the trouble to bring in specimens. As this is the only way to complete the herbarium, it is hoped as many or more may assist in this direction during this year.

The following identifications have been received from Kew :—

Various collections ...	...	...	459
Mr. G. Rogers, approx. ...	...	...	350
Total ...			<hr/> 809 <hr/>

This figure is smaller than 1933, but it does not mean that fewer specimens were handled, as every year an increasing number is being identified here. All the above have been mounted and indexed, as well as several hundreds which were not sent to Kew.

Thirty-two paintings have been added to the collection. Botanical notes with black and white illustrations are prepared for each Journal.

Information has been sent to America, also photos and illustrations, in return for which a monograph of *Stapeliads* has been received.



The following have made use of the Herbarium or asked information :

Mr. Hudson, Kabete Veterinary Laboratory.

Mr. Clennel, Agricultural Department.

Miss Pearson, Edinburgh.

Mrs. Albrechtsen, Naivasha.

Miss Hutcheson, Nyeri.

Mr. Dale, Forest Department.

Mr. MacDonald, Scott Laboratory.

Mr. Beckley, Scott Laboratory.

Lady McMichael, Tanganyika.

Mrs. Goldsworthy, Nyeri.

Mr. Barton Eckett, McMillan Library.

Col. Turner, Nairobi.

Capt. Ritchie, Game Department.

Rev. Mother Florence, Loreto Convent.

Mrs. Hodges, Subukia.

Dr. Taylor, British Museum.

Capt. Dent, Game Department.

Considerable assistance was given to Dr. Taylor of the British Museum, who has promised to present the herbarium with a named set of his collections, and has also offered to revise the identification of the *Labiatae* in this herbarium. During his stay in Nairobi, Dr. Taylor discovered and collected species of the *Podostomaceae* family hitherto not recorded from Kenya.

E. R. NAPIER,

*Botanist.*



# BOTANICAL REVENUE.

EXPENDITURE.		Shs. cts.	RECEIPTS.		Shs. cts.
Botanist's salary	...	...	Balance transferred to General Capital A/c.		4,556 12
Collections	...	...			
Miscellaneous	...	...			
Petty cash	...	...			
		Shs. 4,556 12			Shs. 4,556 12

## CAPITAL.

EXPENDITURE.		Shs. cts.	RECEIPTS.		Shs. cts.
Periodicals	...	...	Donations	...	30 00
Botanical cabinet	...	...	Life subscription	...	300 00
Geological cases	...	...	Miscellaneous	...	62 84
Entomological cabinet	...	...			
*Bongo exhibit	...	...	Balance transferred to General Capital A/c.		4,425 39
		...			
		Shs. 4,818 23			Shs. 4,818 23

\* Additional to special donations and appropriation from Jackson Fund.

## ASSETS.

WRITTEN OFF.		Shs. cts.	ACQUIRED.		Shs. cts.
Depreciation	...	...	Periodicals	...	465 90
Journals	...	...	Botanical cabinet	...	300 00
Bad debts	...	...	Show cases	...	1,622 50
			Entomological cabinet	...	1,675 00
			Books by exchange	...	2,000 00
			Journals, 1934	...	2,220 00
			Bal. transferred to General Capital A/c.		11,273 98
		Shs. 19,557 38			Shs. 19,557 38





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# The Journal

OF THE

## EAST AFRICA AND UGANDA NATURAL HISTORY SOCIETY.

*Jan.—Apl., 1935.*

*Vol. XII.*

*Nos. 5 and 6*

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EDITOR:  
V. G. L. VAN SOMEREN.

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Additional copies to members, 10/-; non-members, 20/-  
Date of Publication: March, 1936.

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# BUTTERFLIES OF KENYA AND UGANDA.

By

V. G. L. VAN SOMEREN, F.R.E.S., F.L.S., etc.

SUPPLEMENT TO VOL. 1.

*Being additional notes and addenda to the groups dealt with in the Journal of the East Africa and Uganda Natural History Society, 1925-1935.*

## INTRODUCTION.

It is now some ten years since the first part of Volume 1 of the serial on the "Butterflies of Kenya and Uganda" appeared, and, as new material and additional observations have accumulated, it is considered advisable to publish a special paper embodying this new data.

For much of the new material, I am indebted to my friend T. H. E. Jackson of Kitale, who has done, and is doing, such excellent work in his district and in Uganda.

Reference will be made to the original notes as they appeared in the several numbers of the Journal, and to the species as dealt with in the Separata of Vol. 1. Corrections to the letterpress have appeared in the Index to Vol. 6 of the Journal.

The order followed will be that adopted in the Journal.

Family DANAIIDIDAE. Sub-family DANAININAE: Genus Melinda.

MELINDA FORMOSA and MERCEDONIA.

Ref. Op. cit. No. 21, pp. 31-32: Vol. 1, Sep. 1, pp. 10-11.

The two representatives of this genus, hitherto considered two distinct species, overlap in their distribution, and in the area of contact, interbreed. Extensive material shows many intermediates. The area of overlap is from Lumbwa-Nandi to Elgon.

As is well known, *formosa* is the model for *Papilio rex*, and *mercedonia* for *rex mimeticus*, the Uganda race. It is therefore interesting to note that the intermediates of these two Danaines act as the model of the intermediate race of *Papilio rex*, *comixtus*, Rothsch., which occurs in the area of overlap. Though these intermediates occur over a wide area, they are associated with true *formosa* and *mercedonia*, to an extent which precludes the recognition of an intermediate race by a distinct name.

The races are therefore: *M. formosa formosa*, Godm., 1880.

*M. formosa mercedonia*, Karsch, 1894.

Intermediates: *M. formosa*  $\leq$  *mercedonia*.

The early stages of all the forms are very similar. The larva of *mercedonia* is rather more ornamented than *formosa* and has more crimson on the segments, especially on the spines.

## Genus AMAURIS.

### *AMAURIS NIAVIUS AETHIOPS*, Roths. & Jord.

This is the Abyssinian race of *A. niavius*, and is distinguished by the narrower and less extended white fore-wing sub-apical bar which does not reach toward the margin of the wing, but stops short of the sub-marginal row of small white spots, thus leaving the spot in 3 quite free.

The race is included in this paper on the evidence of specimens taken by Stoneham in Karamoja. There are two specimens in my collection from Kaimosi, one of which is hardly to be distinguished from *aethiops*, while the other has the spot in 3 quite free.

### *AMAURIS ECHERIA JACKSONI*, E. M. Sharpe.

Ref. Op. cit. No. 21, pp. 39-40. Vol. 1, Sep. 1, pp. 18-19.

Under the heading, distribution, mention was made of the geographical variation noticeable in this species

Typical *jacksoni* are found in the Sotik district (type loc.), and eastwards to Lumbwa and the Mau. Topotypical examples really represent an intermediate between two extremes, a large, almost black ground conspicuous insect ranging in the forests of Kikuyu Escarpment east to Mt. Kenia, and the low rain-forests of Meru, and a smaller more brownish race distributed from the coast through Teita, the Southern Masai Reserve to Kisii and central Kavirondo, N. Kavirondo, Elgon, Kitale, and eastern Uganda.

When laid out in parallel series, the differences are obvious, but as already indicated, the named forms are, unfortunately, just those intermediates which render further sub-division difficult.

It is at once obvious that the insects from the high country of Kikuyu, Uplands, Katamayo, and the Kikuyu Escarpment are not at all identical with the series from Kisii-Kaimosi-Kakamega.

We thus have an eastern Mau race; a coast to western Mau race; and the intermediates of the Sotik-Lumbwa area, typical *jacksoni*.

### *AMAURIS ALBIMACULATA*, s.l.

Ref. Op cit. No. 21, pp. 40-41: Vol. 1, Sep. 1, pp. 19-20.

We are here dealing with an aggregate lumped under one name, omitting, for the time being, the race *hanningtoni*, Butlr.

An accumulation of material collected throughout Kenya and Uganda, clearly indicates that in certain localities, the insects have taken on distinctive colouration.

Butler separated the species from *echeria* in 1875, on certain specific characters already cited, op. cit., on South African material, and East African specimens have been associated therewith, excepting the race *hanningtoni*.

The three distinctive types are as follows: (1) a dark form with small white spots in the fore-wing and dark ochreous hind-wing patch, predominant in the following areas: Southern Masai to Sotik and Kisii, Lumbwa, Mau, Kitale and Kakamega, Aberdares to Meru, all doubtless influenced by the dark *A. ansorgei*, and to a certain extent, *echeria*; (2) a very pale form (distinct from Butler's race *hanningtoni* of the Kilimanjaro-Teita area), with large white spots in the fore-wing, especially that in the cell, and a very pale ochreous to creamy hind-wing patch, *not* clear-cut on the hind margin, and extending almost to the anal angle along the inner margin; these are typical of the eastern and coastal belt of Kenya and Uganda areas; and (3) an upland race, large of size, and intermediate in colouration, ranging through the forested country of Kikuyu and the southern Aberdares, and associated with the dark form of *echeria jacksoni*, and *A. ansorgei altumi*.

#### AMAUROS LOBENGULA SEPTENTRIONIS, Poulton.

Ref. Op. cit. No. 21, p. 42: Vol. 1, Sep. 1, p. 21.

This race was described by Prof. Poulton from material sent to him by me from Marsabit. It is the predominant species in the area, but it is now known to extend westward to Kulal and south of Rudolf at Mt. Nyiro, and doubtless will be found in forested country to the southward.

The early stages are as follows: The eggs are laid on a species of *Cynanchum*, so far unidentified, singly or in small groups, either on the upper or under surfaces of the leaves or on the stem most often near the young growing shoots.

The eggs are a long pear-shape, with slightly parallel sides towards the bottom; creamy when first laid they turn orange, then greyish to black before hatching, about the eighth day. The young larva is greyish-olive without any indications of longitudinal lines, until the second instar, at which period spines appear on the forward and hind segments. The mature larva is 50 mm. long, blackish in ground colour, ornamented with a mid-dorsal orange line composed of discrete or semi-contiguous spots, a dorso-lateral line of similar colour but smaller spots, and a spiracular line.

A few yellowish transverse lines connect up some of the dorsal and dorso-lateral lines, thus giving the appearance of a check pattern. Five long filamentous fleshy spines are present on each side, on the dorso-lateral line on the 2, 3, 5, 10 and 11th segments.



The pupa is very similar to that of *A. echeria jacksoni*. It is a pale translucent greenish gold with some golden marks on the wing scutes, a row on the dorso-abdominal segments, and with dark spiracular spots. The dorso-thoracic area is very pronounced and bluntly pointed, thus accentuating the depression between it and the abdominal protuberance. The head case is angled dorso-ventrally, and square edged. The cremaster pedicle is long and black.

It is of interest to note in passing, that the race of *lobengula* which is found in North Uganda and Abyssinia, is much nearer to the southern race *lobengula katangae* than to *septentrionis*.

*AMAUROS (Amaurina) ANSORGEI ALTUMI*, van Som.

Pl. 1, figs. 1 and 2.

Ref. Op. cit. No. 22, p. 44: Vol. 1, Sep. 1, p. 22 *partim*.

This race was described by me in a supplement to the Journal cited, and was based on some two hundred specimens both caught and bred. I take this opportunity of repeating the description and the figures.

The nominate race is limited to the west of the Mau and north to Nandi; though the types were supposed to have been taken in eastern Uganda, they have not been duplicated in that area since. They are, however, of the very dark race so plentiful in the Lumbwa-Sotik area. This dark race was re-described by Le Cerf, under the name *torrefacta*, type loc. Molo.

The race I have described has its headquarters in the forests of the Kikuyu Escarpment and the Aberdares and has been taken in some numbers at Tuso. It probably also extends to Mt. Kenia on the western side.

It differs from the nominate race in having the patch of the hind-wing much paler in colour (as in *echeria jacksoni*), and having the sub-marginal spots more numerous and almost white.

On the lower surface of the hind-wing there is a marked black line which crosses the ochreous patch at the bases of the cell and area 8.

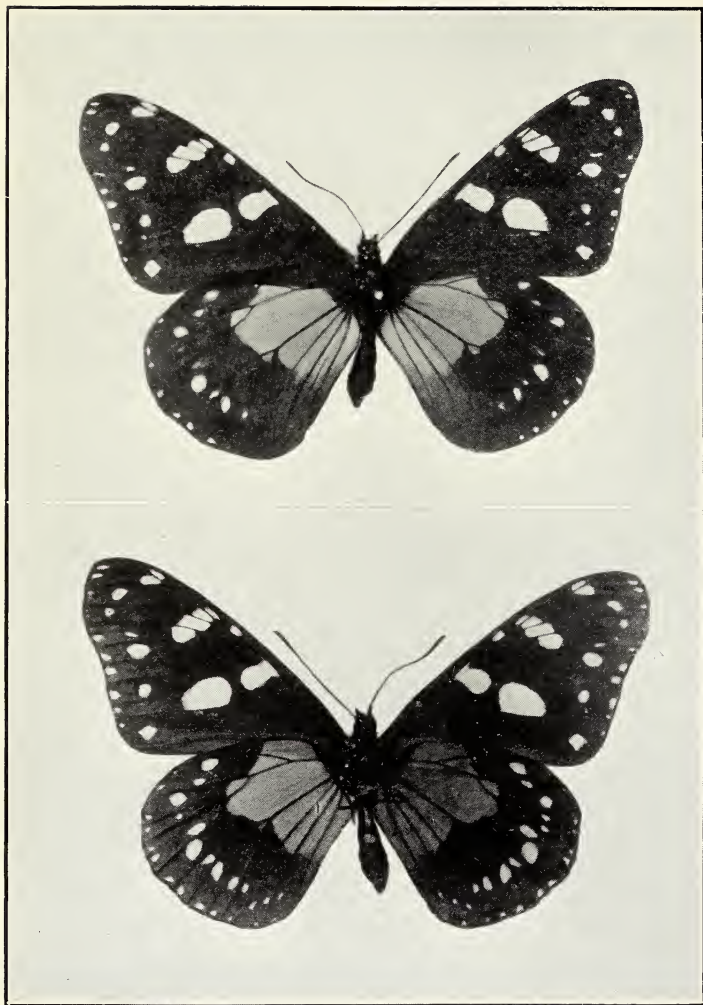
#### EARLY STAGES:

The egg is of the usual amauris type, a long barrel shape, slightly constricted at the top, finely ribbed and ornamented with cross ridges. They are deposited either on the upper or lower surfaces of the leaves and on the young shoots of *Cynanchum* and a species of *Tylophora*. They are creamy to yellow when first laid and have a high glaze. The young larvae are gregarious and feed together in groups of forty and more, eating the fleshy surfaces of the leaves and leaving the ribs almost intact. In the first stage they are ochreous to greyish without



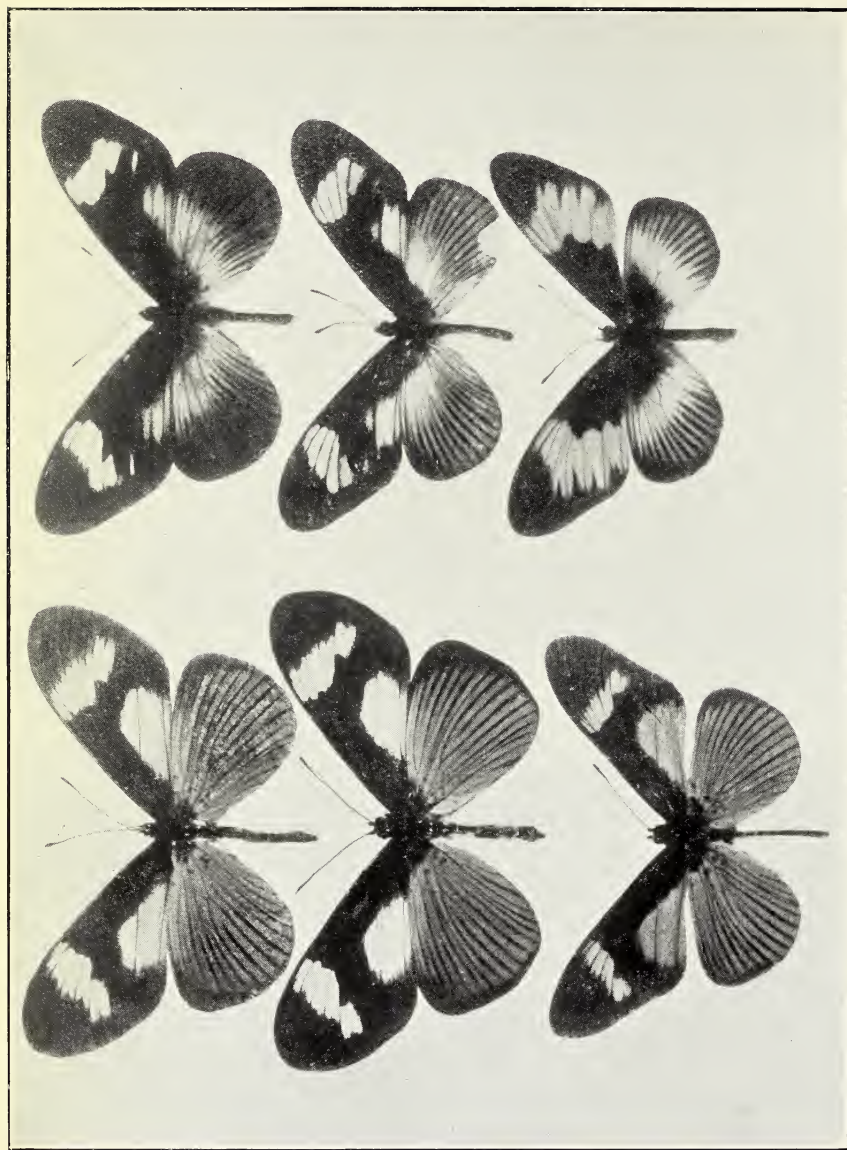


PLATE 1.



*Amauris (Amaurina) ansorgei altumi*, van Som.  
Upper and under surfaces.





*Bematistes schubotzi*, Grunb.

Figs. 1-2. Females.

Fig. 3. Male.

Fig. 1. Female f. *jacksonianus*.

*Acraea jodutta*, Fab.

Fig. 4. Var. f.-w. bar white; hind-marginal patch and h.-w. bar ochreous.

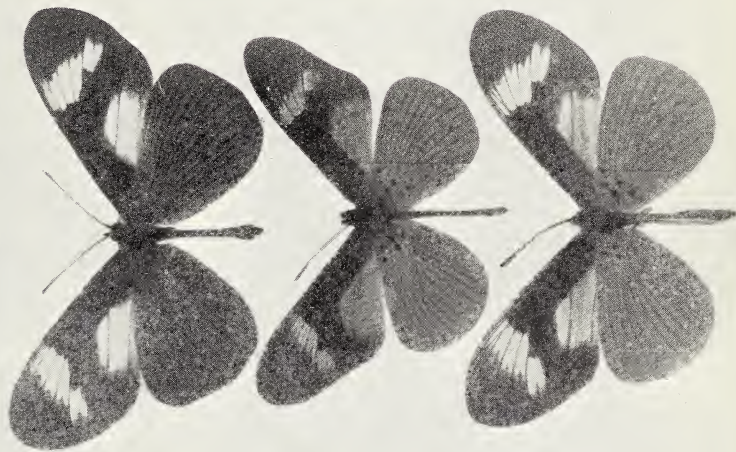
Fig. 5. Var. of f. *integra*.

Fig. 6. *Acraea alciope*, var.





Figs. 1-2.  
*Acraea barteni philos*, Le Cerf  
Male and female.



Figs. 3-5.  
*Bematistes schubotzi*, Grunb.  
Undersurfaces.



Figs. 6-7.  
*Acraea barteni philos*.  
Undersurfaces.





Fig. 1. *A. doubledayi* sykesi, Shp.  
 Fig. 2. *A. althoffi* f.f. *budongoensis*, Carp.  
 Fig. 3. *A. var. neohulae*.  
 Figs. 4-5. *A. solikensis* rorena.  
 Fig. 6. *A. acerata* pullula.

Fig. 7. *A. pelopeia*.

Figs. 8-9. *A. johastoni* butleri.  
 (male and female.)





longitudinal lines and little indication of the body spines which only appear evident at the second moult. In this stage the number of spines on each side is four—but at the third moult a fifth spine develops at the anal end. These spines are present on the dorso-lateral aspect of the segments on the 2, 3, 5, 10, and 11th. The mature larva is very distinctive: the ground colour is purplish-black, a narrow blue line runs along the centre of the dorsum, wide conspicuous orange yellow longitudinal lines placed equidistant along the dorso-lateral and lateral line leaving intervening black areas the same width as the yellow lines. The undersurface is greyish with a purple tinge, more pronounced over the suctorial legs.

The fleshy spines are short compared with those of *echeria jacksoni*.

The pupa is at first pale pink but when hardened becomes a beautiful gold with an extremely high glaze, spiracular spots dark and the cremaster is long-stalked with basal protuberances.

The dorsal aspect of the thorax and abdomen are very prominent with a deep depression between; each abdominal segment is ornamented with black dots, two dorsally, one laterally, one ventral.

The imago emerges in 14-16 days. The pupa case is then brownish though transparent. Held at certain angles the pupa looks very like a baboon's head.

Family ACRAEIDAE. Genus BEMATISTES, Hemming.

This genus replaces *Planema*. Vide Hemming in Carpenter's paper "The Rhopalocera of Abyssinia," Trans. Ent. Soc., Vol. XXXIII, p. 374, 1935.

*BEMATISTES SCHUBOTZI*, Grunb. Sexes unlike.

Pl. 2, figs. 1-3.

Pl. 3, figs. 3-5.

MALE. Expanse: 33-35 mm.

F.-w. brownish black, sub-apical bar narrow, 3-4 mm. ochreous; patch on hind border orange tawny, filling most of 1a, 1b, except for basal triangle and posterior angle, and the basal half of 2. H.-w. orange tawny, slightly dusted with dark scales at the extreme base, with two black dots in the cell and others of the underside showing through. Marginal border widest at outer angle, but narrowing to 2; veins black-scaled narrowly, with narrow internervular black rays between.

Underside: Somewhat as above, but apical portion of fore-wing not so dark and tinged with ochreous; black strongest as a median bar. H.-w. as above but duller, marginal border not so marked at angle;

black spots small, as follows: three at base subcosta, two large, one small in cell, two at base 1c, one at base 1b.

FEMALE. Two varieties are figured.

Larger than the male, 40 mm., with more rounded fore-wings. Sub-apical bar and posterior patch pure white, the hind-patch rather more restricted distally, but sub-apical bar wider and more indented at V.5. Ground colour blacker; h.-w. as in the male, but marginal border wider especially at angle.

The other variety has the sub-apical bar pure white, while the posterior patch is suffused with tawny-orange. f. nov. JACK-SONIANUS.

Type female. Budongo, Sept., 32. T. H. E. Jackson.

Distribution: Collected in the Budongo Forest by T. H. E. Jackson.

BEMATISTES AGANICE UGANDAE, sub. sp. Nov.

Pl. XXXVI, figs. 3 and 6.

Ref. Jrl. No. 29, p. 36, Vol. 1, Sep. V, pp. 102-3.

I have already given full descriptions of the two races as found in Kenya and Uganda. The race *MONTANA*, Butler, type loc. Kilimanjaro, is the Kenya race, while the Uganda race is without a name. I therefore designate it as above.

Type female, Mawakota, Uganda, July, 1929, in Coryndon Memorial Museum, van Som. Coll.

Comparative material: Long series of over 50 specimens of each race.

Sub-family ACRAEINAE. Genus ACRAEA.

*ACRAEA ZETES RUDOLFI*, Eltr.

Ref. Op cit. No. 23, p. 131: Vol. 1, Sep. 2, p. 49. Pl. VI, fig. 8.

This race was described by Dr. Eltringham from specimens sent to him and previously mentioned by me loc. cit. The full description is as follows: The ground colour of both sexes is rosy-red. The fore-wing has a conspicuous sub-marginal row of tawny-orange spots continued nearly to the apex, and *very* distinctly separated from the apical tawny-orange patch which lies in areas 3, 4, 5, 6, 9. The hind-wing marginal black has a sub-marginal row of small but distinct orange-tawny spots. Type male, Oct.-Nov., 1927, Marsabit; female, June, 1924, Marsabit, Dr. van Someren. Co-types Marsabit and Kulal.

The form from Meru is intermediate between *rudolfi* and *zetes acara*; the females in this case are rosy in ground colour, and represent

a 75% aggregate over the area of low-lying country west to Baringo, and south-east to the head waters of the Tana River.

*ACRAEA PENTAPOLIS* = *THELESTIS*.

The food plant of this species is "Magungwa" (Luganda), *Miranthus arboreus* MORACEAE.

*ACRAEA ADMATHA LEUCOGRAPHA*, Ribbe.

Ref. Op. cit. No. 23, p. 126: Vol. 1, Sep. 2, p. 45.

I am indebted to Miss Fountaine for the description of the early stages of this species. The eggs are not described, but the larva feeds on a species of *Rinorea*. "Ground colour yellowish-brown spotted all over with white-centred black spots out of which extend rather short black spines slightly branched. Head black with a broad white collar on the "neck." Pupa very pale green on the wing cases, pale yellow on the abdomen, with a wavy black line and a few isolated black spots."

*ACRAEA PSEUDOLYCIA ASTRIGERA*, Butlr.

Ref. Op. cit. No. 23, p. 134: Vol. 1, Sep. 2, p. 52.

Add to the distribution: Southern Masai reserve to Ngong and the M'bagathi and Narok. The insects were numerous on the flowering acacias along the Ngong-Kajiado road in April, 1935.

*ACRAEA EGINA*.

Ref. Op. cit. No. 23, pp. 134-135: Vol. 1, Sep. 2, p. 54.

Add to the description of the mature larva: Head brick-red; a narrow orange line in mid-dorsum; at base of each spine, a glistening blush-white spot in front; first segment with a transverse black spot with enamelled surface.

Miss Fountaine describes the larva as velvety black profusely spotted with white. Her description is from full fed though not distended larvae; the transverse orange lines are hidden in the folds of the skin.

In the race *harrisoni*, the black and orange transverse bars are more conspicuous, but otherwise the colouration is very similar.

*ACRAEA ONCEA*, Hopp.

Ref. Op. cit. No. 22, p. 144: Vol. 1, Sep. 2, p. 62.

The early stages are as follows: Eggs creamy white, spindle shaped and slightly ribbed, laid on *Adenia* sp. Larva ochreous with glistening bases to the long black spines; some reddish on dorso-lateral

line; head ochreous with an inverted V above the mouth, and broad oblique line over eye disc, and the margin of the face black.

Pupa with black rings on lateral aspect of abdominal segments, black lines on dorsum of thorax, and a series of black veinations on the wing-cases.

*ACRAEA AEQUATORIALIS ANEMIA*, Eltr.

Ref. Op. cit. No. 25, pp. 62-63: Vol. 1, Sep. 3, p. 34.

To the distribution add: Kulal and South Rudolf. It should be noted, however, that examples from Kulal area, though as pale as typical *anaemia*, are larger and with more pronounced spots. These should be recognised as a geographical race.

*ACRAEA LYGUS*, Druce. Pl. 8, figs. 1-4.

In a recent paper by Prof. Hale Carpenter, this species is mentioned as having been taken in the Taru, Kenya. It has also been recorded from Tanganyika Territory, and probably, is to be found in the thorn-bush country east of Kilimanjaro and Teita.

The species has been confused with *A. stenobea*, by both Eltringham and Aurivillius, and Trimen deals with it as a variety of *stenobea*; Carpenter has unravelled the problem in his paper, *Stylops*, Vol. 1, Pt. 9, pp. 196-7.

Through the kindness of Prof. Carpenter I am able to give a figure of male and female from photographs kindly supplied by the Imperial Forestry Institute, Oxford.

It will be observed that the species bears a strong resemblance to *A. natalica*, and for this reason has probably been overlooked.

*ACRAEA CAECELIA PUDORA*, Auriv.

Ref. Op. cit. No. 25, p. 64: Vol. 1, Sep. 3, p. 36.

Eltringham states in his Monograph, Trans. Ent. Soc., 1912, p. 184, that the female form *hypatia* is a form found in Sierra Leone, but he also records one specimen in Tring from Mohoroni, which is in South Kavirondo. Among various examples of this species sent to Dr. Eltringham by me are several examples of this form from Kulal and south Rudolf, so determined by him. I suggest that in reality these Kulal males and females represent a distinct race, as they are more tawny-red and more thickly scaled on the fore-wing. The females are of nearly the same colour as the males. For the Kulal specimens I propose the name *A. CAECELIA KULAL*, sub. sp. Nov. Type ♂ Kulal, Oct.-Nov., 1927.







Figs. 1-6.  
*A. macraea anacraontica*.

Figs. 7-8. *A. rahira*, Bsdv.

Figs. 9-10. *A. bourgeoni*, Schut.  
Fig. 11. *A. thurina*.





Fig. 1. *A. doubleclayi sykesi*,  
Undersurface.  
Fig. 2. *A. rahira*,  
Undersurface.

Figs. 5-6. *A. rahira*, Undersurface.  
Figs. 7-8. *A. goetzi*, Undersurface.

Figs. 9-10. *A. anacreon* vars.,  
Undersurface.  
Fig. 11. *A. bourgaoni*, Undersurface.





Figs. 1-7. *A. bettiana*, vars.

Figs. 8 and 12.  
*Pandopsis punctatissimus*.

Figs. 9-11. *A. goetzi*, Thunr.



PLATE 8.



Photo: Impl. For. Inst. Oxford.  
A. *lygus*, Druce. Upper and under surfaces.





*ACRAEA ACRITA.*

Ref. Op. cit. 23, pp. 139-141. Pl. VIII, figs. 9-10.

Dr. le Doux has kindly examined these specimens and reports as follows:—

Fig. 9. *Ac. acrita acrita* f. *nigromarginata*, le Doux.

Fig. 10. *Ac. (acrita) manca taborensis*, le Doux.

*ACRAEA ANACREON ANACREONTICA*, Gr. Sm.

*ACRAEA RAHIRA.*

Ref. Op cit. No. 25, pp. 70-71: Vol. 1, Sep. 3, pp. 42-43.

I must apologise for the mix-up under these headings. The description given for the latter male should of course refer to that of the former, and the figure of the male, Pl. V, fig. 5, Pl. VI, fig. 10, are *anacreon anacreontica*; whilst figures 6 and 7 of Pl. V, and fig. 11 of Pl. VI are females of *rahira*. The description of the female as given is that of *rahira* female.

It will be noted that in *anacreontica*, both males and females, there is a patch of long ochreous hairs at the bases of the wings, more particularly on the hind-wing, a character which is absent in *rahira*. Pl. 5, figs. 1-6. Pl. 6, fig. 10.

Furthermore, the underside of the hind-wing in both sexes lacks the clear-cut light band outlined distally with black as in *rahira*; and the red areas are more pronounced and L shaped. The black spotting is on the border of this red L, for the most part.

The female of *anacreon anacreontica* is somewhat like the male, but larger, and the ground colour is less orange-red; the spotting and red markings on the undersurface are, however, identical.

Distribution: It is of interest to note that this species has the same distribution as *rahira* in Kenya, and also occurs in Uganda at Buhunge (Hancock leg.). Carpenter states that Uganda specimens are transitional to *anacreon*. They are certainly very reddish.

As there is thus no description of *rahira*, in my notes, the following should be added:

*A. rahira*, Boisd. Pl. 5, figs. 7 and 8. Pl. 6, figs. 5 and 6.

MALE: Ground colour of both fore and hind-wings pale to orange tawny. F.-w. with black along the costa and at the apex; with black dentate rays from the outer margin running into the ground colour along the veins; a small black spot at about mid-cell and a large transverse one at apex of the cell; a row of dark sub-apical spots, almost contiguous, in 4, 5, 6, one in 3 more discreet and situated more posterior; a further dark spot sub-basal in 2 and one below it in 1b. H.-w. slightly

dusted with greyish scales at the base; a narrow black margin, dentate along the veins; dark spots as on the underside, and with an indication of the sub-marginal line of below.

Undersurface: Paler than above, with black spotting as above, but the black dentate marks along the margin only indicated by streaks along the veins, and between these the orange scaling is strong. Colour of h.-w. as fore, but there is a post-discal almost straight bar from the inner margin to 4, outlined with dark scales distally and inwardly demarcated by a series of dark dots in an almost straight line; this line of spots continued from 1b to 5 thence at right angles in 6 and slightly more proximal in 7.

There are two small sub-costal black spots. A further almost parallel row of spots pass from the inner margin and through the mid-cell, double at root of vein 5; a further black spot at base of cell.

Distribution: The range of this species is interesting. Eltringham does not record it from eastern Africa, but we have taken it on the Sosiani River at Eldoret, and Lake Narasha, and more recently it has been recorded from Lango district in Uganda, also Bulemezi, Lake Kioga, and Bunyoro from specimens taken by Hancock.

#### *ACRAEA ENCEDON*, s.l.

Ref. Op. cit.; Vol. 1, Sep. 3, pp. 44-46.

The aggregate hitherto known as *encedon*, in its various forms, has recently received the attention of Dr. le Doux of Berlin, who informs me that there are certainly two species mixed up here, and he supports his distinctions by evidence of genitalia.

I have been unable to follow up in detail the division suggested by this worker, and must refer readers to his writings: *Acraeen—Studien*, IV Mitteil. Zool. Mus., Berlin, Band 17, Heft 2.

Briefly, this author shows that what has hitherto been named *lycia*, auct., a form of *encedon*, is in reality a distinct species with several variations closely resembling similar colour variations in the species *encedon*. But the species *LYCIA*, *F.* does not occur in Eastern Africa.

I take the liberty of giving the forms of *A. encedon* recorded from Kenya and Uganda, as determined by Dr. le Doux:

- f. *fulva*, D.H. & W. Uganda and Kenya.
- f. *infuscatoides*, le D. Uganda and Kenya.
- f. *alcippina*, Auriv. Uganda and Kenya.
- f. *umbratalcippina*, le D. Uganda.
- f. *poultoni*, le D. Uganda.

- f. *encedon*, L.=*sganzini*, Bsd. Kenya and Uganda.
- f. *lycoides*, le Doux. Kenya and Uganda.
- f. *daira*, G. & S. Kenya and Uganda.
- f. *radiata*, Auriv. Uganda.
- f. *perradiata*, le Cerf. Uganda.

For the descriptions of these various forms, I must refer readers to Dr. le Doux's original paper. He shows that *sganzini*, Bsd., is a synonym of *encedon encedon*.

I am able, however, to give a correct determination of the specimens figured on Plates VII and VIII, Jrl. 24. The following are represented:

- Fig. 1. Female, form *fulva*, D.H. & W. Note here, that according to the original description of *encedon*, this is an insect "concoloribus flavis" and not tawny. The tawny form is *fulva*.
- Fig. 2. This is a dark variety of *fulva*.
- Figs. 3-4 are *alcippina*, male and female.
- Fig. 5. Is a female *lyciodes*, le Doux. (*Ac. lycia* is a distinct West African species.)
- Fig. 6. Of this, Dr. le Doux writes: "A very remarkable specimen, transitional to female *daira*." "It must be a rare form. I have handled hundreds of *fulva*, and never seen anything like it."
- Fig. 7. Is a typical male *daira*.
- Fig. 8. Is a transition to male *poultoni*, le Doux.
- Fig. 9. Male *encedon encedon*=*sganzini*, Bsdv. Of this le Doux writes: "A rather dark specimen and slightly transitional to f. *fumata*, Auriv."
- Fig. 10. Is a male *infuscatoides*, le Doux.

#### *ACRAEA SOTIKENSIS*, E. M. Sharpe.

Op. cit. No. 24, pp. 79-80: Vol. 1, Sep. 3, pp. 51-52.

To the distribution add South Kavirondo and Kisii to Lolgorien.

Pl. 4, figs. 4 and 5=f. ROWENA.

#### *ACRAEA WIGGINSI*, Neave.

Ref. Jrl. No. 25, pp. 71-72: Vol. 1, Sep. 3, pp. 43-44.

Through the kindness of Mr. R. T. Evans, I am now able to give a description of the larva and pupa of this species. The food plant is *Cassia zambesiacus*, LEGUMINOSAE, and *Cassia* sp. indet. The mature larva is pale yellow; head creamy-yellow with an inverted V



above the mouth. All spines are strongly branched and black in colour. The anterior legs are black. The pupa is pale yellow shading to creamy on the wing-scutae. These are veined in black. The thorax is ornamented with a club-shaped black line running from the head to about half-way; inside this black line is a Y shaped yellow line arms pointing towards the abdomen; beyond this mark are two diamond-shaped black marks. The abdomen is ornamented with four rows of yellow-centred black spots.

*ACRAEA VENTURA*, Hewit.

Op. cit. No. 25, pp. 86-87: Vol. 1, Sep. 3, pp. 58-59.

Through the kindness of my friend, R. T. Evans, I am now able to give the life history of this interesting species. As I originally suggested, the evidence of the early stages all go to strengthen the view that we are here dealing with an insect distinct from *terpsichore*. It will be noted that the larva is distinct from any of the variations of *terpsichore* and the food plant is different, and in fact, belongs to a widely different family.

Early stages: The eggs are laid in groups on the underside of the leaves of *Cassia zambesiacus*, LEGUMINOSAE. At first pearly-white, they turn canary-yellow, and later, pink. The young larva is at first greenish-yellow with a black head and black spines. At the second instar the larva is uniform greenish-yellow; with the next moult it develops a dark dorsal stripe, the spines remain yellow except for the first two pairs or dorso-lateral ones which turn black; the head is black or red-brown. When black there is an inverted V above the mouth. The larva, when mature, develops alternate black and ochreous banding with three rows of moderately long branched spines, the anterior and posterior three black, the rest ochreous. There is in addition a glistening blue-black spot at the anterior base of each spine; head orange. The pupa is brownish with, on the abdomen, three rows of black circles with orange centres, situated dorso laterally, laterally and ventrally. The thorax is mottled with black; the wing cases are lined with black and the head piece ochre with black marks over the eye-shields.

Observations: Reference to Eltringham's Monograph reveals the statement that *ventura*, Hewitson, is "apparently, only an unusually red *terpsichore*." He states further that should the form with very red bands on the underside prove to be a distinct species, a new name will probably have to be found.

Although Dr. le Doux has placed *ventura* as merely a form of *terpsichore* (thus following Eltringham), which according to him is antedated by the name *eponina*, Cramer, and this name must stand, I



am convinced on the evidence of the early stages and the food-plant, that *ventura* is a distinct species. I would refer readers to Dr. le Doux's papers.

*ACRAEA RANGATANA*, Eltr.

Ref. Op. cit. No. 25, p. 88, No. 27, pp. 213-214: Vol. 1, Sep. 3, p. 60 and Sep. 4, p. 63.

I should like to draw attention again to the specific distinction of this insect form *eponina*, Cram.—*terpsichore* auctorum, more particularly as Dr. le Doux has followed Eltringham and placed it as merely a form of *eponina*.

*ACRAEA OCHRASCENS*, E. M. Sharpe.

Add to the localities: Kisumu; and Bulago, Uganda.

*ACRAEA BETTIANA*, Talbot. Pl. 6, figs. 3 and 4. Pl. 7, figs. 1-7.

Ref. Bull. Hill Museum, Vol. 1, No. 1, 1921.

This insect is said to belong to the *goetzi* group, but I would suggest that it is probably a geographical race of *rangatana* or a closely allied species. There are forms of *rangatana* which are only slightly darker than *bettiana* and the pattern is very similar.

Description: Ground colour brown-black, basal area with a large creamy patch—slightly dusted with blackish at the extreme base—extending from the hind border to beyond vein 3, and continued into the mid-cell; a blackish dot at apex of cell; a distinct narrow creamy sub-apical bar; a marginal series of orange-red streaks from 1b to 7, longest in 3 and 5. Note: In typical *bettiana*, the cream colour in the cell appears to be distinctly separated from the rest of the light patch by a black line of ground colour.

H.-w. blackish-brown ground colour with a central creamy band of almost equal width until area 4-5 when it is produced distad and then narrows in 6-7 at costa; a series of triangles at the margin from 1c to 7 with orange-red at apices; base of wing with slight mottling and indication of the reddish bar of the underside.

Underside: F.-w. pattern as above, but more brownish, and the marginal streaks longer and broader; some reddish scales at base of costa. H.-w base reddish, basal triangle creamy, followed by a reddish and black slightly curved band, the black being in contiguous rings and containing red; a creamy discal band as above; margin with creamy spots separated by long greyish triangular rays, apices distal and between them orange to brick-red.

Female: Very like the male, but larger and paler, sometimes light areas white.

Early stages: Unknown.

Distribution: Uganda specimens come from the Kigezi area, but the type locality is Kisaba Forest Lake Kivu. Talbot has described a variety of the female under the name *kissejensis*. We have no notes on this species, and are indebted to G. R. L. Hancock and D. Buxton for specimens of the species.

*ACRAEA GOETZI*, Thur. Pl. 6, figs. 7 and 8. Pl. 7, figs. 9-11.

Expanse 18-20 mm. General colour orange and black. Sexes unlike.

MALE: Fore-wing greater portion of the wing orange red; distal part black with an orange-red sub-apical bar from the costa to short of the marginal border, at the costa it is yellowish. Costa black; apex and outer margin broadly black, the black of the border extending inward between the sub-apical bar and the basal orange-red, often as an almost parallel sided bar, or sometimes wider toward the costal end, and blacker. Base of wing with blackish scaling, this black sometimes extending as a line along the base of the hind margin. In some specimens the marginal black on the outer edge carries small orange internervular spots. Sometimes the sub-apical bar is lighter in colour than the red of the base of the wing.

H.-w. base thinly scaled with black; marginal border broadly black with or without small internervular yellowish spots; rest of wing orange-red, paler at the inner edge and angled somewhat in area 5.

There is a general resemblance on the upperside to *A. acerata tenella*.

Underside: Greater part of the wing dull orange; sub-apical bar yellow ochre and separated by the black irregular bar which does not extend to the border; costa greyish, apex and marginal border orange with black streaks edged with ochreous along veins.

H.-w.: Ground colour ochre-yellow; a red rectangular mark with black ends at about mid-sub-costa, a further obtuse L shaped red mark, short arm at base of wing, long arm in 1c adjoining the cell; one black spot at base of cell, three in 1b, and a black line from inner margin to end of red mark; a further black spot or wavy line at base of v. 5. Border narrowly ochreous and internal to this a wide red bar narrowly black lined internally and intersected by ochreous streaks black-edged and black-centred along the veins.

FEMALE: Resembles somewhat the male form with marginal spots to f.-w. border, but these marginal spots larger and paler; the red of the basal half of the wing suffused with tawny and with a large black somewhat triangular mark at mid-point in 1b apex reaching cell. H.-w. orange tawny, dusky at base; border widely black and carrying internervular triangular yellow-ochre marks at edge; wing fringe greyish-ochre.

Underside as in the male.

Distribution: Has been taken in the Bechunzi-Kegezi country, Ankole.

*ACRAEA ALTHOFFI* f.f. *BUDONGOENSIS*, Carpenter.

Pl. 4, fig. 2.

Ref. Op. cit. No. 27, pp. 214-215: Vol. 1, Sep. 4, pp. 64-65.

This interesting form was taken by T. H. E. Jackson in the Budongo Forest and has been described by Carpenter as follows: "Resembles the form *telloides*, Eltr., except that the pale sub-apical spots in areas 3-6 of the fore-wing are white instead of tawny-orange."

There are very similar forms of *A. jodutta* named *dorotheae* and *integra*; both these *Acraeas* are very similar to the *Bematistes schubotzi*, Grunb., taken by Jackson in the Budongo. *A. jodutta integra* flies with this form of *althoffi*, Katera, Aug., 1935.

Stoneham has drawn my attention to the fact that the form *ochreatea*, Eltringham, is antedated by *ochreatea*, Grunb.; thus *ochreatea*, Eltr., must be renamed.

*ACRAEA BAXTERI PHILOS*, Le Cerf. Pl. 3, figs. 1 and 2, 6 and 7.

Ref. Op. cit. No. 27, p. 219: Vol. 1, Sep. 4, p. 69.

This race has been described by Le Cerf from material obtained on the Cherangani Hills by Messrs. Jeannel and Chappuis (*Bull. Soc. Ent. de France*, Vol. 28, No. 10, p. 158).

This species is very variable as evidenced by the fact that three forms of it have been described from Tanganyika. The type came from Mpwapwa, and is figured by Eltringham, *Trans. Ent. Soc.*, 1912, Pl. V, fig. 10. I referred my specimens to the form *subsquamia*, Thaur. The type has the fore-wing sub-apical clear bar almost parallel sided, whereas in the form from the Usambaras the clear area in 4 is longer than the other two and extends further distad. This is also the case with specimens from the Kikuyu Escarpment and the Sotik district.

I give a figure of the male and female from these areas, and suggest that specimens from Kenya should be referred to the race

*PHILOS*, le Cerf. It will be noted that the male has a clear area in 3, further, that the black of the margin surrounds a red spot in 1b, and the black extends along veins 2 and 3 and cuts the red in the base of area 2. The undersides differ in the sexes.

*ACRAEA PELOPEIA*, Staud. Pl. 6, fig. 2. Pl. 4, fig. 7.

Expanse: 29 mm.

This *Acraea* was obtained by T. H. E. Jackson in the Kalinzu Forest, Uganda, in January, 1935.

MALE: F.-w.: Ground colour black, strongly scaled at the apex and along the outer margin, less heavily in the cell, and only slightly in the basal half of areas 5-6, longer semi-transparent streaks in 4-2, and most of 1b; red-tinged in 2 and with a distinct orange-red spot at distal end of semi-transparent streak in 1b.

H.-w.: Basal area to just short of the apex of the cell and a narrow marginal border, black to brown-black, the basal area with black spots from below, rest of wing orange-red. Abdomen with transverse yellow lines, golden spots on lateral surface; underside yellowish with black ventro-lateral line.

Undersurface: F.-w. costa, apex and outer margin tawny orange with black veining and narrow black lines in interspaces; rest of wing hyaline; reddish spots of above also present.

H.-w.: Ground colour orange-tawny with the red of above showing through; veins black with black lines in interspaces. Black spots as follows: one each centrally in 1a-2; two sub-basal in cell; one each sub-basal in 1a, 1b; one at base of sub-costa.

Distribution: Kalinzu Forest, Uganda. A rare insect hitherto not recorded further east than the Beni Congo. It has a strong resemblance to *Ac. penelsos*.

*ACRAEA SEMIVITREA*, Auriv.

Ref. Op. cit. No. 27, p. 227: Vol. 1, Sep. 4, p. 77.

The distribution of this species was inadvertently omitted in the original published notes. It should read as follows: In the forested areas, and park country of Uganda from Toro, east to Nandi and rarely to Lumbwa.

*ACRAEA PULLULA*, Grunb. Pl. 4, fig. 6.

A specimen of this has been taken by Jackson at Kakamega. It would appear to be merely a variety of *A. acerata tenella*, lacking the



sub-apical orange-red bar. In this specimen there are a few reddish scales and the orange-red of the cell is separated from the rest of the reddish patch by a black line. The undersurface generally resembles *acerata tenella*.

*ACRAEA AMACITIAE*, Heron.

Ref. Op. cit. No. 27, pp. 231-232: Vol. 1, Sep. 4, p. 81.

The female of this species resembles the male in general markings but the light areas are brownish to ochreous.

*ACRAEA ITURINA*, Gr. Sm. Pl. 5, fig. 11. Pl. 6, fig. 12.

Ref. Op. cit. No. 22, p. 123.

We now give a figure of this species from a specimen kindly supplied by T. H. E. Jackson.

✧ *ACRAEA BOURGEONI*, Schut. Pl. 5, figs. 9 and 10. Pl. 6, fig. 11.

This species bears a superficial resemblance to *A. cerasa* and *A. iturina*. It differs from the former in that the ground-colour red does not extend to the end of the cell but only as far as the sub-costal black spot in the cell, which spot is not free from the costa as in *cerasa*; the hind-wing spotting is larger and more numerous and in this somewhat like *iturina*.

F.-w. : Distal two-thirds thinly scaled with blackish slightly more so along the veins and margin to apex, but not so strong in the latter two as in *cerasa*; the basal red extends only as far as a black sub-costal spot mid-way in the cell and on the hind-margin stops short of the hind-angle; a black streak at base of 1b; a narrow long line at base 1a. H.-w. : Ground colour red, slightly paler on the inner margin between the two rows of black spots and along the costa. Marginal border narrowly black scaled with a concentration of black scales on the veins. Black spots as follows: Black scaling at base of wing especially at base of cell and bases of 1a and 1b. The black spots are in three rows; the basal consists of three, sub-basal in 1a, the cell, and 7, the second series, above and distal to junction of vein 6-7, basal in 5, mid cell, mid 1a and 1b, a third irregular series distad in 1b, sub-basal 2, 3, 4, distad in 5, 6, and almost touching the marginal black border.

Underside: Strongly hyaline, f.-w. with red area showing through. H.-w. spots as above, red areas of above replaced with rosy whitish. Female like the male but larger and slightly paler. A var. of the male has a white area on the h.-w. on inner margin between mid and distal row of spots to cell and the costal pale streak is white, and thus extremely like a small example of *A. admatha leucographa*.

Habitat: Kalinzu Forest.

✧ Since going to Press, Prof. Carpenter has informed me that his original identification of this insect is wrong. It represents a new species which he is describing. V.G.L. van Someren.

*ACRAEA QUIRINALIS*, Gr. Sm.

Ref. Op. cit. No. 27, pp. 230-231 : Vol. 1, Sep. 4, p. 81.

The early stages are still incomplete, but I am now able to give certain portions of it. The larvae feed on a species of *Urerea*, URTICACEA. They are brownish up to the second instar, then turn darker brown with slight ochreous banding, a pale dorsal line, an interrupted spiracular line and pale brownish underside. The spines are long and branched and generally ochreous, the two foremost and the two at anal end dark brown. The pupa is ochreous with two wide dorso-lateral lines of contiguous spots with yellow centres; a lateral line of black circles with yellow centres; abdominal surface with a double black streak on each segment. Wing cases streaked in black; a black streak on the "shoulders" and angle of eyes black streaked, and a broad black line on the thorax.

*ACRAEA PENELOPE*, Staud.

Ref. Op. cit. No. 27, p. 221 : Vol. 1, Sep. 4, p. 71-72.

Early stages: This species lays its eggs on the same food plant as *quirinalis*, *Urerea* nr. *hipselidendron*, URTICACEA. The young larvae are gregarious, grey-brown up to the first moult, then umber-brown, to the final stage. The spines are long and black. The head black; narrow transverse ochreous broken lines between the series of spines; lateral line ochreous, and lower surface of body greyish. Spiracles red-brown.

Pupa: Either ochreous or dark brown; with a dorso-lateral line and ventero-lateral series of contiguous spots with orange centres, a broad ventral series with a central triangular yellow mark, a distal crescentic mark and two dots. On the dorsum there is an inverted V between the eyes, a line from the apex of the V to a point on the thorax where it divides into a trident; two ovoid marks on either side, with a curved streak distad; a spot and a V on the "shoulders," and wing cases veined in black.

*ACRAEA OREAS*.

We have noted this species laying on the *Urerea* as above, but the various stages have not been noted. The fact that several species of *Acraea* feed on this plant makes it difficult to separate up wild-taken larvae.

*ACRAEA MELANOXANTHA*, Sharpe.

Ref. Op. cit. No. 27, pp. 223-224 : Vol. 1, Sep. 4, p. 73.

We have succeeded in breeding this insect in the Kitale area. The food plant is a species of *Adenia*, indet. PASSIFLORACEAE. The

larva is olive brown with faint longitudinal pale lines in line with the series of spines, each spine with a black basal spot anteriorly, strongly branched and reddish-ochreous to orange yellow except the first pair, they are orange at the base and black distally and longer than the rest. The head is rusty red.

The pupa is remarkably unicolourous; the dark marks are somewhat ? shaped and arranged in serial lines—dorso-lateral, ventro-lateral, and a few dark streaks ventrally; the wing cases are only slightly lined while the " shoulders " have three divergent streaks, the thorax has a dark central line and this is continuous with the stalk of a Y mark on the head; the two head projections are rather more developed than usual and black on the ventral surface, and there is a crescentic mark on the dorsal base.

*ACRAEA DISJUNCTA*, Gr. Sm.

Ref. Op. cit. No. 27, pp. 235-236: Vol. 1, Sep. 4, pp. 85-86.

The early stages are now complete. The eggs are laid on the stem and especially young shoots of *Urerea hipselidendron*, URTICACEAE, and are creamy white, turning yellow, then brown before hatching. The young larva is greyish-olive at first, then black with short spines. At the third instar, it becomes more ornamented, the ground colour being dark ochreous with blackish lines. The dorsum of the first segment has a large black transverse spot; an interrupted black line runs the length of the dorsum of the segments and each segment is finely lined transversely, with black up to the spiracular line which is bright ochreous; the underside of the body is buffy, the bases of the fore legs black, the others ochreous. The body spines are short, ochreous, and strongly branched, except the first pair which are long and less branched. The head is black except for fine ochreous hairs directed over the eyes. Length of mature larva 30 mm.

The pupa is fairly constant in colour, though some may be paler than usual in ground colour. The usual colour is pale brown with dark spots in series—a row along the dorso-lateral line slightly raised, ochreous in colour and outlined in dark brown, a latero-ventral series similar in colour, a ventral series more rectangular in shape but similar in colour; black lines around the cremaster; a central thoracic line with two branches is continued toward the head; this line is yellow spotted; on either side of the Y is a loop; wing cases veined brown, with streaks on the shoulders; head projections black-tipped.

*ACRAEA ESEBRIA*, f.f. *VICTORIS*, Poulton.

Ref. Op. cit. No. 27, p. 239: Vol. 1, Sep. 4, p. 89. Pl. XXX, fig. 8.

Professor Poulton has named the above form from females bred by me during 1923. The description is as follows: "Females resembling the male *protea*, but the ochreous marks of a paler tint, and differing from Trimen's female *protea*. . . ." The sub-apical band narrow and all pale areas pale ochreous. This form is genetically stable. Much work requires to be done to clear up the relationship of the various named forms—for example there is a male form which agrees with the ♀ form *metaprotea*, Eltr.

*ACRAEA JODUTTA*, f. *INTEGRA*, Schultz and Auriv.

This form has been taken by Jackson in the Budongo Forest and resembles *Planema schubotzi* f. *jacksonianus* to a marked degree.

*ACRAEA JOHNSTONI BUTLERI*, Eltr. Pl. 4, figs. 8 and 9.

Ref. Op. cit. No. 27, pp. 242-243.

Through the kindness of my friend T. H. E. Jackson, I am now able to give a figure of this interesting race. Jackson states that this race is very common on Ruwenzori and the Kalinzu forest.

It has been bred in numbers and is always constant, there being no other forms of *johnstoni* in these areas. It is a mimic of *Bematistes quadricolor*.

Miss Fountaine has supplied me with the description of the larvae and pupa. Larva, ground colour leaden grey, deep yellow stripes centred black between each segment. Spines yellow; head black. Pupa very pale cream colour, lined sparsely with black, with five rows of abdominal red spots slightly margined with greyish-black. Food plant a species of *Fleurya*.

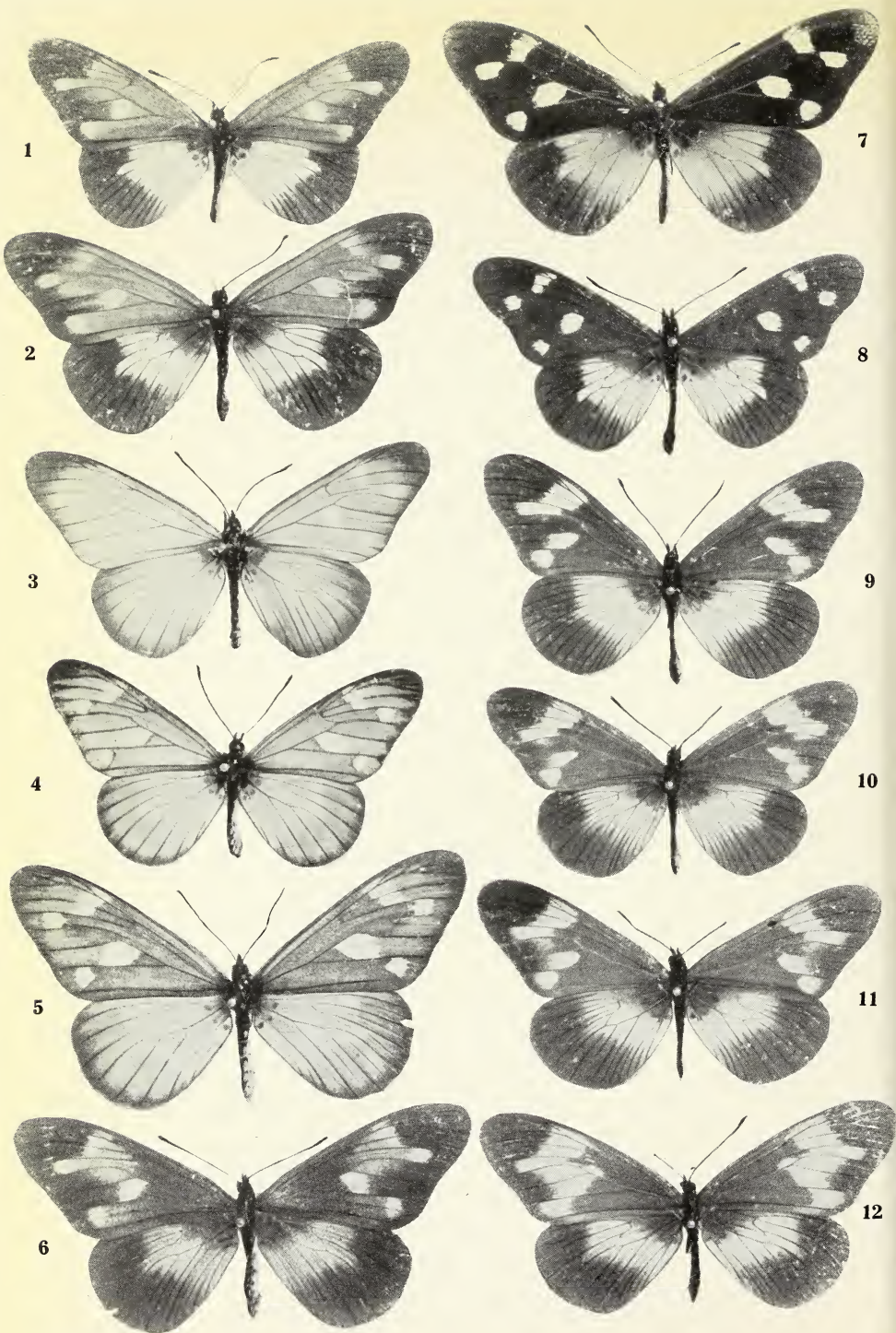
Prof. Carpenter has written an exhaustive paper on the various races and forms of this species and through the kindness of Prof. Poulton and the kind permission of the Entomological Society I am permitted to use the plates illustrating the article and to quote therefrom. Two new forms are described which occur within the limits of our areas; they are as follows:

Form *valdemaculosa*, Carp. Vide Plate 10, fig. 9.

A form of *confusa*; it is characterised by the large size and pure white of the pale areas in both sexes. Elgon and Teita.







A. Robinson, Photo.

Natural Size.

Forms of *Acraea johnstoni*, Godman.

# EXPLANATION OF PLATE 9.

Forms of *Acraca johnstoni*, Godman.

All specimens in the Hope Department, Oxford University Museum, unless otherwise specified.

- FIG. 1. Form *johnstoni*, Godm. ♂. Tanganyika Territory, Usambara, Mubirioni, Tanga-Moshi Railway. July 14, 1916. *W. A. Lamborn*. Very little black suffusion of fore-wing, spots cream-coloured on tawny ground: central area of hind-wing white.
2. Form *johnstoni*, Godm. ♀. Uganda, E. Province, Mbale station, near Mt. Elgon. Aug. 10, 1911. *S. A. Neave*. No black suffusion of fore-wing: spots very little lighter than tawny ground-colour: central area of hind-wing white.
3. Form *fulvescens*, Oberth. ♂. Kenya Colony, Dabida Mt., Taita, 100 m. N.W. Mombasa. May 30, 1904. *K. St. A. Rogers*. Very uniformly coloured light brown: the spots only slightly paler and the broad border of the hind-wing scarcely differentiated: a narrow black margin only.
4. New form *pretiosa*, mihi.\* ♂. Nyasaland, Mt. Mlanje. May 13, 1913. *S. A. Neave*. British Museum. Differs from 3 in large size and shining whiteness of spots.
5. New form *pretiosa*, mihi. ♀. Port. E. Africa, Mt. Chipirone, 1700 ft. Nov. 3, 1913. *S. A. Neave*. British Museum. Differs from 4 in being slightly suffused with black.
6. Transitional form. ♀. Uganda, Mt. Elgon, Bulago camp, 7000 ft. Dec. 23, 1928. *G. D. Hale Carpenter*. Fore-wings like *johnstoni* with much black suffusion at base: spots very little different from surrounding tawny ground-colour. Hind-wing with strongly marked black patch at base, the paler area tawny. Might be classified as a form of *octobalia*, Karsch.
7. Form *semialbescens*, Oberth. ♀. S.E. Sudan, Didinga Mt., Nagichot, 6700 ft. Jan. 4, 1926. *G. D. Hale Carpenter*. Spots of fore-wing pure white; central area of hind-wing tawny.
8. Form *flavescens*, Oberth. ♂. S.E. Sudan, Didinga Mt., Nagichot, 6700 ft. Jan. 1, 1926. *G. D. Hale Carpenter*. Spots of fore-wing, and central area of hind-wing, lemon yellow.
9. Form near *praelongata* ♂, Joicey and Talbot. ♂. North end L. Kivu. Mt. Ninagongwe, 1900-3000 metres. End of September, 1907. *R. Grauer*. Tring Museum. Spots of fore-wing white, central area of hind-wing yellowish-white. Ground-colour of fore-wing very slightly suffused with reddish scales. Cf. Pl. 10, fig. 10.
10. Elementary form of *butleri*, Auriv. ♂. Uganda, Western Province, west of Ankole forest, 4500-5000 ft. Oct. 14, 1911. *S. A. Neave*. British Museum. Spots of fore-wing and central area of hind-wing dull yellow: base of fore-wing slightly purplish-brown.
11. Form *butleri*, Auriv. ♂. Same data as 10. Spots of fore-wing orange, central area of hind-wing tawny, with darker streaks. Base of fore-wing purplish-brown.
12. Form *butleri*, Auriv. ♀. Uganda, W. Province, Toro, Mpanga forest, 4800 ft. Nov. 13, 1911. *S. A. Neave*. British Museum. Fore-wing bar orange: base of fore-wing purplish-brown. Central area of hind-wing tawny, paler along inner margin, streaked with darker tint.

\* Prof. Hale Carpenter.







# EXPLANATION OF PLATE 10.

Forms of *Acraea johnstoni*, Godman, with species to which they have synaposematic resemblance.

All specimens in the Hope Department, Oxford University Museum.

- Fig. 1. *Planema quadricolor latifasciata*, E. Sharpe. ♀. Uganda, E. Province, Mt. Elgon, Buananya, 7000 ft. Nov. 29-30, 1924. *G. D. Hale Carpenter*. Bands on fore- and hind-wing orange, base of fore-wing purplish-brown.
2. *Planema quadricolor latifasciata*. ♂. Uganda, W. Province, Toro, 7000-9000 ft. Nov.-Dec., 1900. Native collector of *C. A. Wiggins*. Description as 1. Model for 3.
3. *A. johnstoni butleri*, Auriv. ♂. Data as 2. The band on the fore-wing is unusually complete for a male. Cf. with figs. 10 and 11 on Pl. 9. Mimics 2.
4. *Planema poggei*, Dew. ♂. Uganda, E. Province, Busitema, between Mt. Elgon and L. Victoria, 4000 ft. Jan., 1923. *G. D. Hale Carpenter*. Band on fore-wing orange, on hind-wing white. Model for 5.
5. *A. johnstoni johnstoni*, Godm. ♀. Kenya Colony, Taveta, 2500 ft. May 15, 1905. *K. St. A. Rogers*. Fore-wing black at base: spots dull yellow, area between spots orange. Hind-wing white central area. Mimics 4. An unusually large specimen.
6. *Amauris albimaculata*, Btlr. ♂. Uganda, E. Province, Mt. Elgon, Bulago, 7000 ft. Dec. 25, 1928. *G. D. Hale Carpenter*. Spots of fore-wing white, central area of hind-wing yellow. A small specimen of the type serving as model for 7.
7. *A. johnstoni confusa*, Rog. ♂. Same locality as 6. Dec. 24, 1928. *G. D. Hale Carpenter*. Spots on fore-wing white, central area of hind-wing yellow. Mimics 6.
8. *Amauris dannfelti*, Auriv. ♂. N.E. Rhodesia, N. Lake Bangweolo, Luwingu, 4200 ft. July 18, 1908. *S. A. Neave*. Black and white. Model for 9.
9. *A. johnstoni valdemaculosa*, f. n. mihi. ♀. Nyasaland, Mt. Mlanje. April 16, 1913. *S. A. Neave*. The type specimen. Black and white. Mimic of such *Amauris* as 8.
10. *A. johnstoni confusa*. ♂ var. Kenya Colony, Dabida Mt. 4500 ft., about 100 miles W.N.W. of Mombasa. May 31, 1916. *K. St. A. Rogers*. Black and white. An important variation with a white patch in area 3 of fore-wing. Cf. Pl. 9, fig. 9.



6



7



8



9



10

Robinson, Photo.

$\frac{1}{2}$  Natural Size.

Forms of *Acraea johnstoni* and their models.





Form *pretiosa*, Carp. Pl. 9, figs. 4 and 5.

Like *fulvescens*, but with the fore-wing spots large and pure white. Dabida, Teita.

These two forms are figured by me on Pl. XXXIII, figs. 6, 9, 10; and Pl. XXXIV, figs. 8 and 9.

For the distribution and prevalence of the various forms in each area, I would refer readers to Prof. Carpenter's paper, *Trans. Ent. Soc.*, Vol. LXXX, 1932.

The form *octobalia*, Karsch, is rather scarce, but occurs in the Elgon, Kenia, and Dabida-Teita areas. This has the fore-wing spots and hind-wing patch tawny yellow. An extreme variation of this is in my collection: it has the ground colour of the fore and hind-wings a deep brown black and the spots of the fore-wing and hind-wing patch a deep tawny-ochreous, almost rusty. This specimen is probably derived from the forms *johnstoni* and *octobalia*.

Two large bred families from the Kitale district derived from *confusa* parents gave 43 and 48 *confusa* offspring.

*ACRAEA ANSORGEI*, Gr. Sm. Pls. 11 and 12.

Ref. Op. cit. No. 27, pp. 232-235. Vol. I, Sep. 4, pp. 83-84.

Since writing the original notes on this species some of my bred material has been submitted to Dr. Eltringham, and determined as far as possible, according to already named forms. My previous notes therefore require considerable modification, and amplification.

The rough division into two groups as indicated on p. 233 of the Journal No. 27 and p. 83 of Sep. No. 4, still holds good. As regards the figures on Pl. No. XXVI, I have taken the liberty of again reproducing them with amended determinations. Vide Pl. XXVI. This plate is supplemented by a fresh one depicting forms not previously figured. The general division as given on pp. 83-84 of Sep. 4 should be modified as follows:

Group A. More or less of the *conjuncta* pattern, having a broad dark hind-wing border.

1. Spots on fore and hind-wing bright tawny orange=*conjuncta* (male). Pl. 12, fig. 1. Pl. 11, fig. 8.
2. Spots on fore and hind-wing paler, more naples yellow=*conjuncta* (female). Pl. 12, fig. 6.
3. Spots on fore and hind-wing as 1, but spots smaller and that in 1b reduced and separated from 2=*interrupta*, Eltr. Pl. 11, fig. 9.

4. Spots on fore and hind-wing much as in 1, but deep tawny orange to chestnut=f. nov. RUFONIGER. Pl. 11, figs. 1 and 2.  
Type ♂, Uplands, April, 1926.
5. Spots on fore-wing creamy; patch in hind-wing ochreous, hind-with border strong=f. nov. LUTEFLAVA. Pl. 11, fig. 7.  
Type ♂, Tusso, Nov., 1926.
6. Spots on fore and hind-wing patch pale ochreous, paler than *conjuncta*, h.-w. with border=*silacea*, Eltr.
7. Spots and patch in hind-wing as in 6 but sub-apical series white=*mutata*, Eltr. Pl. 11, fig. 6.
8. All spots in fore-wing white, hind-wing patch tawny-orange, dark h.-w. border broad and defined, or may be rather ill-defined. f. n. TRICOLOR. Pl. 12, figs. 3 and 4.  
Type ♀, Uplands, April, 1926.
9. Very like 8, but discal spots tinged with yellowish, and that in 1b vestigial. Pl. 12, fig. 4 (intermediate form).
10. Hind-wing as in 8, but spots in fore-wing naples-yellow=f. nov. FLAVIPUNCTA. Pl. 12, fig. 2.  
Type ♀, Uplands, April, 1926.
11. Spots in fore-wing and hind-wing patch white, spot in 1b often reduced to streak=*pica*, Eltr. Pl. 12, fig. 5.
12. Spots in fore-wing rich orange-red; hind-wing patch white or distally tinged pinkish-ochreous=*lutealba*, Eltr. Pl. 12, fig. 7.
13. Somewhat like *lutealba*, but fore-wing spots larger and less defined, often with orange rays extending in 3 to 6 to outer margin; hind-wing patch orange-ochreous, paler toward base. H.-w. border with dark rays=f. nov. ADAURANTICA. Pl. 12, fig. 13.  
Type ♀, Uplands, April, 1926.
14. Sub-apical spots pure white; other fore-wing spots rich tawny-orange, hind-wing patch rich tawny-orange; marginal border rusty-brown with black at margin=f. nov. CHRYSSIPOIDES. Pl. 12, fig. 14. (This form bears a remarkable likeness to *Danaida chrysippus*.) Type female in Coll. Ruscoe, Escarpment, 1918.

Group B. Forms in which the hind-wing dark border is wanting; or only indicated by dark rays.

1. Ground colour orange-tawny; apical portion of fore-wing black-brown, sub-apical spots tawny; basal black limited to basal  $2/3$  of cell, the base of 1b and angle of 2. Hind-wing entirely orange-tawny except for slight dark rays at margin and slight dark suffusion at base=*ansorgei*, Gr. Sm. Pl. 11, fig. 3.

=*aurata*, Bryk. Syn.

2. Very similar to 1, but dark areas reduced, especially at base of fore-wing=*aurivilliana*, Bryk. Pl. 12, fig. 11. Fig. 12 a modification of this form.

3. Fore-wing dark areas as in *ansorgei*, but spots ochreous, while hind-wing lacks dark border, this area being orange ochreous, paling towards base; base slightly suffused with dusky scaling (a form near *silacea*, Eltr.)=f. nov. *FLAVEOLA*. Pl. 11, fig. 4.

Type ♀, Uplands, April, 1926.

4. Somewhat like 3, but less suffused with orange-ochreous on the hind-wing and fore-wing spots=*loveni*, Bryk. Pl. 12, fig. 9.

5. Dark markings as in 3 and 4, but fore-wing spots and hind-wing pale creamy ?=*jeffreyi*, Bryk. Pl. 12, fig. 8.

Pl. 11, fig. 5, is a modification in which the extreme border of the hind-wing is blackish and black rays extend inward.

6. Fore-wing spots tawny-orange; hind-wing entirely creamy but for slight dusky scaling at extreme base=f. *vansomereni*, Bryk. Pl. 12, fig. 15.

7. Sub-apical spots white, other fore-wing spots creamy-yellow, hind-wing entirely orange-tawny=f. *paulinae*, Bryk. Pl. 12, fig. 10.

The types of all the forms here described are in the Coryndon Memorial Museum, Coll. van Someren. The forms are represented by bred series from known parents and batches of wild larvae.

Distribution: Add to the distribution: Kiptiget, Sotik, Mara River and Tusio, Eastern Aberdares.

Observations: Examination of a series of this species, numbering 180 odd examples, reveals some interesting facts. The forms *conjuncta*, *interrupta*, *rufoniger*, *tricolor*, *luteflava*, are essentially male forms. Of 40 *conjuncta*, there are four females, similarly coloured to, or slightly paler than, the males. Of eight *rufoniger*, two are females, coloured

as the male. Of four *tricolor*, one is a female. Of 22 intermediate between *conjuncta* and *rufoniger* all are males. Of six *luteflava*, all are males. Of *interrupta* all are males. All the other named forms are entirely females.

All males have a dark border to the hind-wing; the majority of females are without this border, or if present, it is not so defined or dark as in the males.

There is some variation in the shape of the fore-wing; many are short and rounded.

A very interesting fact is, that in this species, we find just such variations as one meets with in *Papilio dardanus polytrophus*, the common *Papilio* in the "home" of *A. ansorgei*, i.e. Kikuyu Escarpment, forested zone. And the reason? To appreciate this resemblance, one has to see the variations of the two, set out side by side.

*PARDOPSIS PUNCTATISSIMA*, Bdv. Pl. 7, figs. 8 and 12.

This species was omitted from my previous paper owing to some uncertainty regarding its affinities. It has been provisionally associated with the *Acraeas* but as pointed out by Eltringham, "the fore feet are of the usual Nymphalid kind, but the middle and hind feet have the tarsal extremities of a structure quite different from that in *Acraea*." He adds further, that "it would almost appear that *Pardopsis* . . . should have a sub-family to itself."

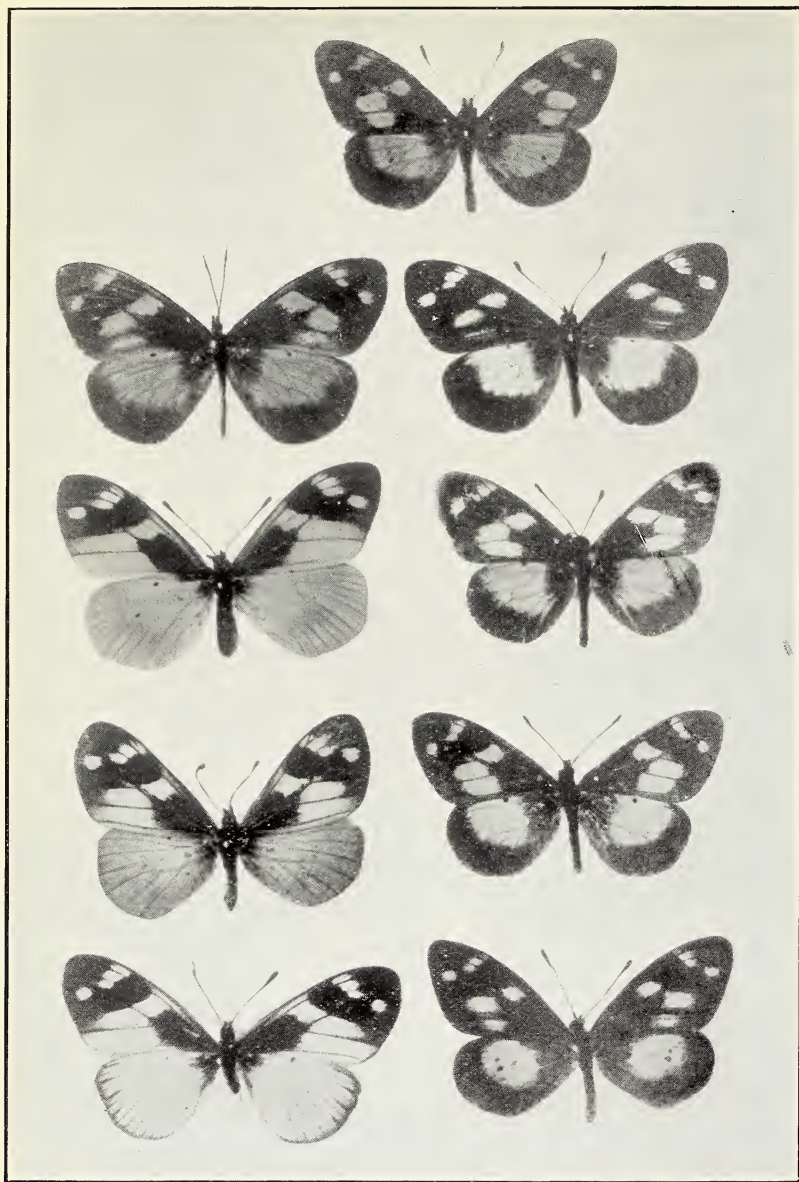
The fact that it is *acraea*-like in habits and flight is not sufficient to associate it with that genus, and one must base its position on morphological characters. It is of interest to note, therefore, that the egg, larva, and pupa are of the *acraeinae* type. I have bred the insect on a species of recumbent herb belonging to the *PASSIFLORACEA*. The egg is a long spindle-shape with longitudinal ridges and slight cross marks, yellow to cream in colour at first, then turning greyish before the larva emerges. The larva is greyish, slightly translucent, and adorned with very short branched spines in rows, dorso lateral, lateral and ventrolateral, of the same colour as the body. A mature larva has a centro-dorsal pale ochreous line and cross-lines of the same colour behind each series of spines. The thoracic spines, and also those of the penultimate segment, are darker and longer than the rest.

The pupa is elongate, and very similar to that of *Ac. terpsichore*, but the head is less bifid, and the abdominal ornamentation is a series of incomplete crescentic marks with pale central marks. The venation on the wing cases is fine and hardly darker than the grey-ochre ground colour.





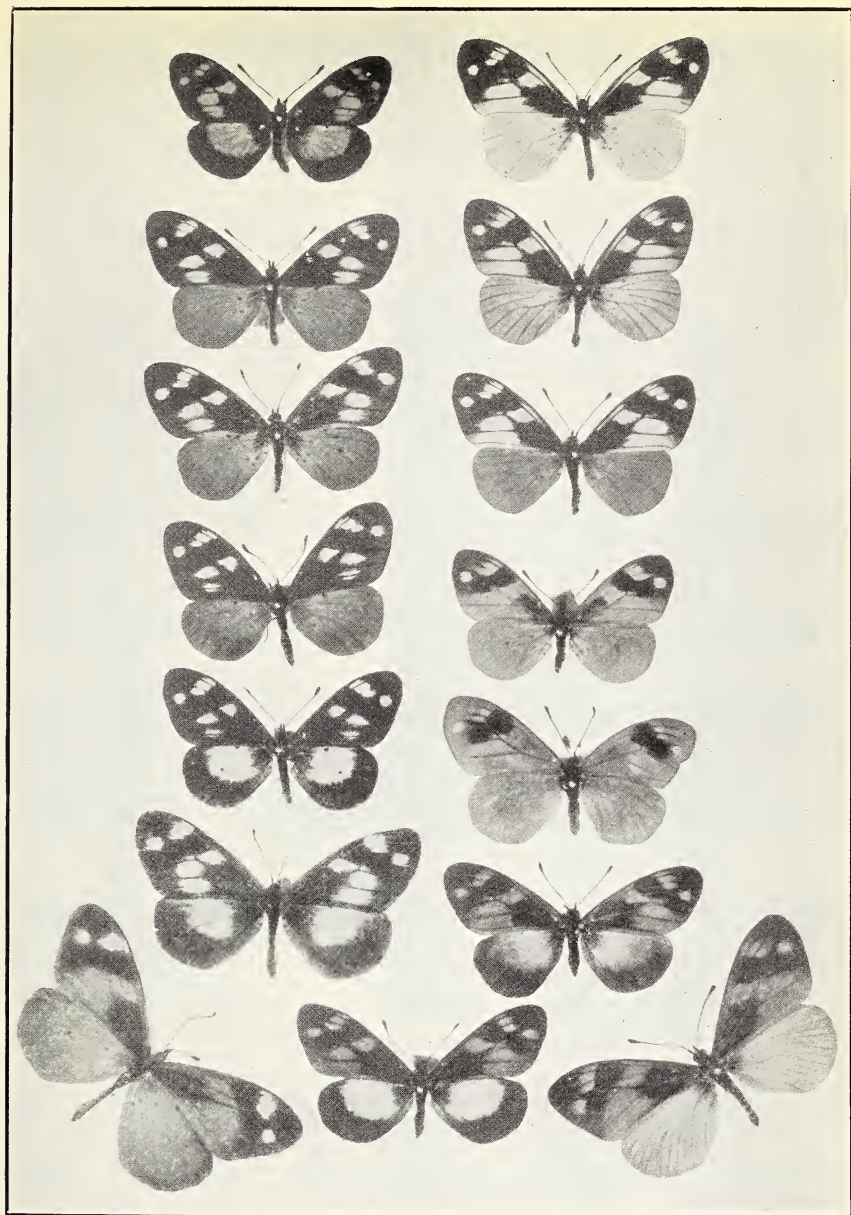
PLATE 11.



Variations of *A. ansorgei*.

Figs. 1—2. *f. rufoniger*.  
 Fig. 3. *f. ansorgei*.  
 Fig. 4. *f. flaveola*.  
 Fig. 5. *f.*

Fig. 6. *f. mutata*.  
 Fig. 7. *f. luteflava*.  
 Fig. 8. *f. conjuncta*.  
 Fig. 9. *f. interrupta*.



14

7

15

Variations in *A. ansorgei*.

- Fig. 1. *f. conjuncta*.  
 Fig. 2. *f. flavipuncta*.  
 Figs. 3—4. *f. tricolor*.  
 Fig. 5. *f. pica*.  
 Fig. 6. *f. conjuncta*.  
 Fig. 7. *f. lutealba*.  
 Fig. 8. *f.*

- Fig. 9. *f. loveni*.  
 Fig. 10. *f. paulinae*.  
 Fig. 11. *f. aurivilliana*.  
 Fig. 12. *f. aurivilliana*.  
 Fig. 13. *f. adaurantica*.  
 Fig. 14. *f. chryssipoides*.  
 Fig. 15. *f. vansomereni*.





The ground colour of the fore and hind-wings of the imago is tawny ochreous, with numerous black spots arranged in a constant pattern (vide plate), and the apex of the fore-wing is blackish.

Distribution: This species has a very wide distribution, being extremely common at the coast (where it acts as the model of a Liptenine, *Telipna amanaida*, examples of which are extremely like the model) extending through the dry thorn country of the Masai to N. Kavirondo, and on the east, through Ukambani to Rudolf, thence west through the more open country of Uganda.

Though not found at the high altitudes, it occurs at Nairobi, and is to be seen in the forest clearings but not in the forest itself. At the coast, however, it occurs in the open forest quite frequently.

*NYMPHALIDAE. Nymphalinae, Charaxidi.*

Genus *EUXANTHE*.

*EUXANTHE TRAJANUS VANSOMERENI*, Poulton.

Ref. Op. cit. No. 30, pp. 59-60: Vol. 1, Sep. VI, p. 113 and plate.

The eastern race of *trajanus*, as indicated in my notes, is distinct from the nominate race and was described by Prof. Poulton in *Trans. Ent. Soc.*, Vol. 77, 1929.

The race has been bred by me and as already stated, the horns of the larva and that of *Eux. tiberius tiberius* and *tiberius meruensis*, mihi are very similar and quite distinct from those of the other species of this genus. It rather suggests that we should recognise a sub-genus for these two species with such distinctive larvae and general facies in the imagines.

The food plant of *Eux. trajanus vansomereni*, is identified as "Muziru" (Luganda) *Deinbollia*, SAPINDACEAE.

*EUXANTHE TIBERIUS*, Smith.

I have long suspected that the specimens of *tiberius* from the low-lying forests of Meru would prove to be a constant geographical race, when more material was forthcoming. I based my view on material bred by me, but unfortunately undersized.

The Meru insect has recently been taken in some numbers by Messrs. Hamilton Gordon and Berkeley and also by Miss Fountaine and Barton Eckett. This material has now been placed at my disposal. I therefore describe the race as follows:

EUXANTHE TIBERIUS MERUENSIS, Sub-sp. Nov.

Pl. 13, figs. 1 and 2.

MALE: Differs from the coastal race in being much richer in colour generally; the sub-marginal row of white spots in both fore and hind-wings smaller; the yellowish spots of the fore-wing deeper yellow and, on the whole smaller; the hind-wing ground colour deeper purply-blue-black; the amount of rufous at the base of the fore-wing more extended in lb.

Underside: The same general remarks apply to this surface.

FEMALE: Differs from the nominate race in that the pale spots are reduced in size, especially those of the central bar; further, all these spots except the sub-marginal ones are lemon-cream, not pure white; further, the hind-wing patch is lemon-cream and almost rectangular especially in the outer and hind angle; the mid-row of spots are cream; the sub-marginal ones of both fore and hind-wings, white; the hind wing patch as above but slightly paler and the sub-marginal row of small treble white spots are diffusely edged with black.

A series of thirty odd examples, male and females compared.

Type male, Meru Forest, March, 1929, in Coryndon Museum.

Type female, Meru Forest, March, 1935, Berkeley Leg. in the Museum.

The food plant of the race is *Deinbollia* nr. *kilimanjarica*, SAPINDACEAE.

The females of this race bear a decided resemblance to *Melinda formosa formosa*.

*EUXANTHE WAKEFIELDI*.

The food plant of this species is *Deinbollia kilimanjarica*, SAPINDACEAE.

*AUXANTHE CROSSLEYI ANSORGEI*.

*AUXANTHE EURINOME ANSELLICA*.

The food plants of these two species is *Phialodiscus zambesiascus*, SAPINDACEAE.

Genus CHARAXES.

*CHARAXES FULVESCENS*.

Attention was drawn in my notes to two distinct races of *fulvescens*, within Kenya, Op. cit. No. 31, p. 119, and the tentative identification of one as *acuminatus*, Th., Pl. LII, figs. 1-2; a high country race

inhabiting the forests of Kikuyu, to the Aberdares and Mau, and a mid-eastern race of the Elgon-Nandi area west of the Mau, and a mid-eastern race of the Elgon-Nandi area west of the Mau, which I had bred in 1916. Both these races have been bred by me in large numbers and both are constant.

In my published notes I refrained from applying new names to these obviously different races, because no typical examples of *acuminatus* from Tanganyika could be compared neither here nor in England. However, since my paper Jeffrey of Kitale has named the Elgon race STONEHAMI, Bull. Stoneham Museum, No. 4, Sept., 1931.

*CHARAXES PROTOCLEA AZOTA*, Hew.,

Ref. Op. cit. No. 31-32, p. 126: Vol. 1, Sep. VII, pp. 140-141.

The following may be added to the early stages of this insect: The eggs are laid singly or in twos on the leaves of *Afzelia cuanzensis*, Welw., LEGUMINOSAE, and also on *Syzygium* sp. nr. *guinensis*, MYRTACEAE. They are rather barrel-shaped, flattened on top, with distinct fluting, and rounded at the base. Colour cream until the fourth day when they turn brown along the upper lip then all over, then blackish as the larva is ready to emerge. As with most species the young larva devours the egg shell. The larva is dull olive with black horns and stippled face; tail end bifid and spotted with white. It turns green at the next moult. The head of the mature larva is somewhat reminiscent of that of *Ch. candiope*, though with less divergent lateral horns; the horns are rusty brown, and this colour is carried down along the border of the facial disc to just above the mouth parts which are black. There is a pale ochreous line internal to the brown border. The body of the larva is strongly irrorated with yellowish tubercles most conspicuous along the lateral line and the "tail." Dull ochreous oblique lines pass to the suctorial legs. The dorsal marks are well shown on the plate cited; they are putty grey with blue dots on the edges or dull greyish-pink with blue; the central ornamentation has a distinct oblique cross. The pupa is a beautiful object, pink and chocolate, and has already been described.

*CHARAXES LUCRETIUS*, Cram. Pl. 14, fig. 2.

Ref. Op. cit. No. 31-32, pp. 132-134: Vol. 1, Sep. VII, pp. 146-148.

We have now succeeded in completing the life history of this species, which is as follows: The eggs are laid on the young leaves of "Runaba"; *Hugonia platycephala*, Welw., LINACEAE. "Kiasira" of the Buganda. The eggs are small, almost spherical, slightly con-



stricted at the top, slightly flattened and fluted, and creamy in colour. The larva is at first dull brownish-olive with minute white dots, head black and irrorated and "tails" whitish. At the first moult it turns dull green, the irroration is less marked and ochreous; the head is then brownish along the top, greenish on the lower half. The full grown larva is bright leaf-green finely irrorated with yellow, no dorsal ornamentation on the specimens reared, but the spiracular line is bright yellow with bright blue spiracles; the undersurface of the body pale whitish-green; head green strong tubercled, with a faint ochreous line from the central long pair of horns to the lower angles; three black dots just above the angles; margin of head slightly yellowish, and serrated along the back; horns short, central ones almost straight with a slight inward tendency at tips, outer pair the same, all slightly brownish at distal two-thirds with darker brown to black tubercles; interspaced horns short and often black-tipped. Length 60-65 mm.

Pupa pale green, almost unicolourous, some slight white mottling on the wing cases and a black streak along the wing ridge; spiracles yellow with blue oblique line; cremaster pedicle short, and dark brown, offset on either side by two kidney-shaped tubercles convexity toward base, and two almost circular lobes on the anal ventral surface. Pupal period six weeks.

*CHARAXES LACTITINCTUS*, Karsch. Pl. 14, fig. 1.

Ref. Op. cit. No. 31-32, pp. 134-135: Vol. 1, Sep. VII, p. 148.

With the help of Jackson and Evans, I am now able to give a description of the female of this species. It seems to appear in two forms: the one very like the male, but larger and with long tails and wider whitish areas; the other taken by Jackson has the light areas of the fore-wing strongly suffused with rufescent so as to almost obliterate the whitish patch; the same in the hind-wing, except in the mid-disc which still retains the bluish-white, but this is edged distally with a bright rufescent area; the fore-wings are less black, more suffused with rufescent and the paler orange rufescent spots are wider. The undersurface is strongly marked in the fore-wing in both the silvery and dark marks, while the hind-wing has a strong chestnut post-discal bar edged with lilac-grey, narrowly on proximal edge, and widely on distal side; the marginal border is rufescent finely edged with blackish lunules in the interspaces. There are also some silvery lines and spots in the upper basal area. This latter form I name JACKSONIANUS, f. nov. Type ♀, Jackson Coll. in Coryndon Memorial Museum.

The early stages of the species have been described by Jackson, Jrl. No. 42-43, p. 173, but for convenience are repeated here. Food plant *Syzygium cordatum*, MYRTACEAE. Larva rather light green; the skin has a rough appearance due to numerous papillae. The body





PLATE 13.



*Euxanthe tiberius meruensis*, van Som.  
Male and female. Upper and under surfaces.



PLATE 14.



*Chx. lactitinctus*, female.  
f. *jacksonianus*, van Som.

*Chx. lucretius*, female.



PLATE 15.

3



2



1



Variation in *Ch. pelias harrisoni*.



1



2



3



Variation in *Ch. pelias harrisoni*.

Showing a gradual dark suffusion over the basal area of the fore-wings especially, but widening of marginal border. Fig. 3 very like *Ch. j. epijasius*.





line is pale yellowish white and the anal extremity is bluntly bifid. There are two large dorsal spots, one on the 6th, the other on the 8th segments, colour enamel white, in fact startlingly so; that on the 8th is oval, the other circular and smaller. The head is green outlined with whitish, shield-shaped, much longer than broad and square across the mouth parts. There are four principal horns, thick, blunt-ended and almost straight, roughened with papillae; the inner pair are 6 mm. long on the outside, tipped with dark red for 2 mm.; the outer pair are 3 mm. and almost entirely red. The outer horns curve slightly inward and all four are glazed in appearance.

The pupa is plain light green with no red markings whatsoever, except on the spiracles, which are reddish-brown. It is shaped rather like that of *pollux*, except that the abdominal segments curve away sharply from the cremaster. The head case is almost square, and there is practically no depression or "waist" mid-way across the wing-cases; anteriorly it is straight. Cremaster pale olive brown with bilobed processes on either side and two triangular excrescences in front and below on the ventor of the anal segment. Pupal stage 36 days.

*CHARAXES JASIUS EPIJASIUS*, Reiche. Pl. 17, fig. 3.

Ref. Op. cit. No. 31-32, pp. 135-137: Vol. 1, Sep. VII, pp. 149-152.

As with many species of *Charaxes*, *epijasius* is subject to varying degrees of melanism; an extreme example is figured. The whole of the upper surface, with the exception of the marginal border and a few blue spots at the anal angle, brown-black, and where the blue area of the hind-wing should be, it is here olive. It is thus very like *jasius*.

*CHARAXES PELIAS SATURNUS*, Butlr. Pl. 15, figs. 1 and 3.

Pl. 16, figs. 1 and 3.

Ref. Op. cit. No. 31-32, pp. 138-140: Vol. 1, Sep. VII, pp. 152-155.

*CHARAXES PELIAS HARRISONI*, Sharpe.

Here also melanism is often met with, but again in no genetically stable form. It is especially evident in the race *harrisoni*. I find in a series of some twenty topotypical examples, a great deal of variation, some examples being just as pale and with black areas just as restricted as in examples of *saturnus*, from the coast, but on the whole, the dark brown areas at the base of the fore-wing and hind-wing are darker and the post-discal bar is narrower and darker; the blue spots of the hind-wing are larger, and in many cases the hind-wing submarginal pale

border is paler and wider, but this last character is somewhat variable. On the other hand, there are three specimens from this South Kavirondo area which are here figured, which show certain characters found in *epijasius*, viz. the very wide pale border to both hind and forewings, especially the latter, and a diffusion of the fore-wing markings into the very dark brown, and obscuring the fore-wing bar. One might almost suspect fig. 3, pl. 16, to be a hybrid between *harrisoni* and *epijasius*.

Add to the food plants of this species: *Gymnosporia senegalensis*, CELAESTRACEAE.

### CHARAXES HANSALI BARINGANA, Rothsc.

Ref. Op. cit. No. 31-32, pp. 142-143: Vol. 1, Sep. VII, pp. 156-7.

This insect has now been taken in South Kavirondo and quite commonly in the Kitale district. These Kitale specimens exhibit a greater number and more prominent row of spots outside the post-discal row than do specimens from the Voi-Taveta area.

The life history has now been completed, except for exact notes on duration of the various instars. The eggs are laid on a shrub or bush known to the Swahilis as "M'swaki" and determined by Kew as *Salvadora persica*, SALVADORACEAE. It is also reported on *Osyris* sp. SANTALACEAE. The eggs are rounded barrel shape with round bottom and flattened top, strongly ridged, with a slight circular depression inside the rim and a central raised spot. The colour is white or creamy at first then turns ochreous; the germ develops and a brown ring appears at the upper margin and shortly the whole egg turns brown then blackish. The young larva is olive with a black head and slight signs of papillation. After the first moult the general colour becomes green with the head of the same colour, with a central brown line and large dark patches on the lateral discs. The horns are divergent and brown. At the next instar the head is greener, the brown facial mark disappears but the face is outlined with yellowish with a black margin; the horns are rufous to their bases with a slight extension of this colour on to the facial disc; the short intermediate horns are black. Having again moulted, the body greener, very finely papillated with yellowish, but there is no dorsal ornamentation. The head is green, the facial margin turns yellow; the horns are green except for the tips, which are rufous; the face line is edged with black which colour extends up the posterior surface of the two outer horns. The intermediate horns are now green.

The mature larva is pale green finely stippled with yellow; some few examples develop two dorsal spots, reddish in colour and outlined

with small yellow and dark green spots, situated on the 6th and 8th segments. The spiracular line is yellow, and the spiracles blue; the lower surface of the body is pale pinkish green. The head is now green; a fairly broad yellow border runs round the face and up the outer side of the lateral horns almost to the tips; small black spots are present at the lower angles on either side of the mouth; the horns are short and robust, green in colour and rufous tipped; the intermediate horns are green, the median ones sometimes black tipped.

Pupa pale green and without any ornamentation other than the blue spiracles. The head is only bluntly bifid. The cremaster is ochreous with a black base to the stalk, two lateral lobes are present, and on the anal segment, ventral surface, two long ochreous tubercles. The imago is as a rule very uniform in colour, but we have two which have the light areas of both fore and hind-wings rich ochreous and thus similar in colour to *castor flavifasciata*.

#### *CHARAXES CASTOR FLAVIFASCIATA*, Butlr.

Ref. Op. cit. No. 31-32, p. 146: Vol. 1, Sep. VII, p. 160.  
Pl. LXVII, fig. 2.

We have now bred this race in very large numbers. Of 30 odd examples there are three which exhibit a divergence from the normal in that the basal area of both fore and hind-wings up to the middle of the cell is rufescent to chestnut, and the hairs on the abdomen are also of this colour. Pl. 17, fig. 2. They are merely sports and not stable.

The early stages are not very different from those of *castor*; the larva are not however so robust either in build or in horn development; the colouration, especially the dorsal ornamentation, is not so bright. Vide Pl. CVII, fig. 5. The food plants at the coast are Mukoma-koma and Katugo (Luganda) as yet unidentified.

Various forms of *castor* have been described: thus Rothschild and Jordon described a form which differed from the nominate form in that the interspaces in the basal area of the underside were black: Unyora and Nandi. From my long series, this is the usual form in Uganda. The name applied is f. *GODARTI*.

Rothschild described a form of *castor flavifasciata* as *REIMERI*. This differs in just such a way as does the form *godarti*, from the nominate race. Typical *flavifasciata* has the interspaces chestnut: *reimeri*, black.

Then there is a sport which has been given a name by Stoneham: *Ch. castor* var. *aginga*. This differs from the nominate form in having the upperside black except for a slight trace of the alar bar especially in the sub-costal region of the hind-wing, and the sub-marginal row of



blue spots, and marginal yellow crescentic marks. On the underside, the white bar is reduced especially in 6-8 in the fore-wing. I figure such a sport on Pl. 17, fig. 1.

*CHARAXES DRUCEANUS PROXIMANS*, Joicey and Talbot.

Ref. Op. cit. No. 33-34, pp. 3-5: Vol. 1, Sep. VIII.

Pl. LXXIX, fig. 1.

We are now able to give a figure of the female: Pl. 18, figs. 1 & 3.

There are two varieties of the male: one in which the hind-wing black carries no blue spots, the other, in which this area has large blue spots. Similar variations are found in the females. The specimen figured has these spots well developed.

A race of this species has been described by Lathy under the name *SEPTENTRIONALIS*. The locality appears to be Toro in Uganda. From the description it would appear to be intermediate between the nominate western form and the eastern race.

An additional food plant of this species is *Syzygium cordatum*, and *guiniensis*, MYRTACEAE.

*CHARAXES DRUCEANUS* var. *ALICIA*, Stoneham.

Pl. 18, figs. 1 and 2.

The type, and unique specimen, was described by Stoneham as a species. T. H. E. Jackson has examined it on my behalf and is of the opinion that it represents a variation of *Ch. druceanus*.

The original description is as follows:

“ Fore-wing, above: The red-brown basal area is bordered distally by a black band, which is indented distally. The red median band is very narrow and covered with dusky scales. The black border is wide throughout its length.

“ Hind-wing, above: The red-brown basal area is restricted, and the orange bar is absent, being represented by a small spot in cellule 8. Practically the whole of the hind wings are a beautiful glossy blue-black, with four light-blue submarginal spots, and bordered by bright orange.

“ Fore-wing, underside: The silver-white median bar is absent, and the whole underside bears a dull appearance. There is a faint trace of a bar, dull silvery-grey in colour, extending from cellule 9 as far as cellule 4 only. The rest of this area is dark brown. The black spots in 1b, 2 and 3 are large, and, more or less, kidney-shaped.

“ Hind-wing, underside: Ground colour brown. There is a broad median band of dark chestnut narrowly bordered proximally by silvery grey, and distally by a series of silver-grey streaks. The basal area is



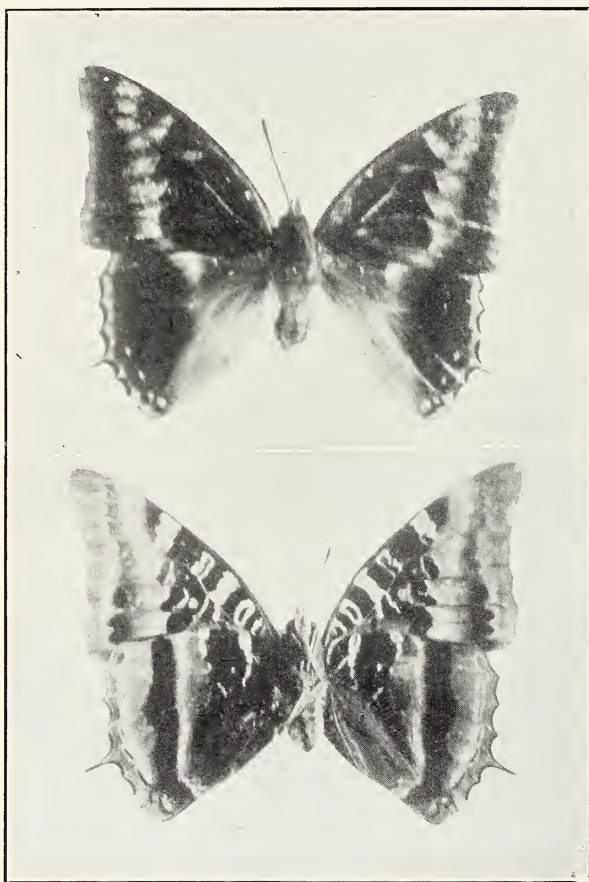




Fig. 1. *Ch. castor* var. *aginga*, Stoneham (melanistic).  
Fig. 2. *Ch. castor flavifasciata*, var.  
Fig. 3. *Ch. jasius epijasius*, var. (melanistic).



PLATE 18.



*Photo: C. Thorold.*

*Ch. druceanus*, var. *alicia*, Stoneham.





Figs. 1 and 3. *Ch. druceanus proximans*, females, one with strong sub-marginal blue spots in h.-w.  
 Fig. 2. *Ch. eudoxus cabacius*, female.  
 Fig. 4. *Ch. eudoxus cabacius*, var. *amaurus*, female.



PLATE 20.



*Ch. euloxus cabacus*, var. *amaurus*. Female and male. Upper surfaces.





traversed by two narrow silver lines only, which, however, only extend from 8 to the cell, one near the base thereof, and the other through the middle. There is a fine and short silver-grey line in 1b."

Distribution: Kitale. The author states that he has seen other specimens.

*CHARAXES EUDOXUS CABACUS*, Jordon.

Pl. 19, fig. 2 (female).

Ref. Op. cit. No. 33-34, pp. 6-8: Vol 1, Sep. VIII, p. 174.  
Pl. LXXX, fig. 2.

We now give a figure of the female. It will be noted that it resembles the female of *druceanus proximans* to a remarkable degree on the upperside; the chief difference being in the extent of the black area of the distal half of the fore-wing. For early stages vide next form.

To the previous brief description of the female, add the following:

F.-w.: Base rufescent-chestnut to approximately mid-point in 1a, 15 mm., then inclined inward at 1b toward root of v. 2 where it is 5 mm., then filling the triangle between this point and the root of v. 3. In some examples there is also a small rufous area at angle of v. 3. It fills the cell to almost the apex, where it is cut short by a black bar, and sometimes more proximally by a double crescentic black mark. The rufescent colour also extends along the costa for half its length. The distal portion of the wing is black-brown traversed by a tawny orange bar, 8-10 mm. wide in 1a, 8 mm. in 1b, 5 mm. in 2, and thence by discreet rounded spots decreasing in size to 7. The inner margin of the wing carries orange spots on 1b-3 are concave. The outer margin of the wing carries lunate orange-tawny spots, double in 1b up to apex. Beyond the black bar, at apex of cell, is a tawny bar and beyond this again, a further orange-tawny spot in the black ground of 5 and 6. Sometimes the dark cell bars of below show through.

H.-w.: Basal area rufescent chestnut, with sometimes a blackish area sub-costal in 7-8. Beyond this a wide orange-tawny band 8 mm. wide in 8 where it is contiguous with the marginal orange, slightly wider in 7, then 1 mm. wide in 5-6, 8 mm. in 4, widening again in 3 and becoming wider and diffuse toward the inner edge and merging into the basal rufescent. Margin with a broad orange-tawny band of contiguous lunules with extension of this into the "tails," the extreme edge black; between the marginal orange and the tawny-orange band, the wing is black-brown with a double purple spot at the anal angle.

As already remarked, it is somewhat like female *druceanus proximans*, but the fore-wing bar has not the Y at the end of the band.

Compared with females of the form *amaurus*, it may be noted that in *amaurus*, most examples have less rufescent spots in the black

ground beyond the apex of the cell, and the general appearance is darker, than in *cabacus*. It is doubtless influenced by *lucretius*.

Undersurface: The marks are as in the male but on a paler ground and the light markings are less silvery.

In dealing with this group, *Chx. eudoxus*, we meet with considerable difficulty. Prof. Poulton, in *Trans. Ent. Soc.*, 77, part II, 1922, briefly recounts the various races so far described, and mentions the material, of the various races known, in England.

The nominotypical *eudoxus* is apparently still insufficiently represented in the "home" museums, not only as regards males but females also (Sierra Leone to Cameroons). Apparently a race with a broad f.-w. band and broader h.-w. band, "both red-yellow" in colour, the f.-w. band extending to SC4.

The race *mechowi*, Rothschild, was described from (type) Angola, Beni, Congo. The f.-w. band narrower and tapering more abruptly towards the apex and reaching Sc. 5, the four upper spots small and luniform. The h.-w. band broader than in *cabacus*. No female described.

The Hill Museum possessed one female; it may now be in the British Museum.

In dealing with these two races, it is of interest to note that Holland, in *Bull. American Museum*, Vol. LXIII, Art. VI, records three males from Medje as *eudoxus*, on the evidence of the reduction of the silvery bands on the lower surface, and by the prolongation costa of the median fulvous band of the f.-w. on upper side.

He states that they are at once distinguishable from *mechowi*, of which he had seven males, from presumably the same locality. He therefore makes *mechowi* a species.

We next come eastward and find that in 1932 Le Cerf describes a single male from Ktembo, Lake Kivu, as *theresae*. He states that this specimen is intermediate in general appearance between the S.sp. *mechowi*, R. & J., West Africa, Angola, and *cabacus*, Jordan, East Africa. The general tone of the upperside much less dark than *cabacus* and almost as light as *mechowi*. On the f.-w. the basal chestnut area extends just to the discocellulars and distally is divided by a black line; the post-median light band is wider at its origin; 8 mm. between 1 and 2, than *mechowi* and *cabacus* and much more rapidly attenuated, 2 mm. to v. 3 but not reaching 3; beyond this one does not see more than three spots, the last very small. The marginal tawny spots are much smaller than in the two forms cited. There is one tawny spot 2 mm. in diameter in the interspace 6-7. The tawny band in h.-w. is 10 mm. at v. 5 and 6.5 mm. at v. 7; beyond this it dilates rapidly to the outer border and forms a long point at the base of 8, near its origin; this projection is divided by a black vertical streak arising from the basal dark area. The post-discal black band is 8 mm. between

8-6, smaller between 6-2 and 4 mm. between 2-3. The underside of both wings much more resemble *mechowi* than *cabacus*.

We know that the character of the fore-wing bar in the males is variable within limits in any one race but the interesting point in Le Cerf's description is that his race is *lighter* than *cabacus*. This description is of interest to us locally; whether it can be accepted as representing a good race remains to be proved.

Next in distribution, we come to the specimens taken by Jackson and Jeffrey in the Katera Forest, west of Lake Victoria and north of the Kagera River. Bearing in mind the above description of *theresea*, it is interesting to note that Jackson's specimens are extremely dark, much darker than *cabacus* or *mechowi*, as I describe later, and whose female is quite distinct from all others.

Further east still we have the race *cabacus*, Jordon, described from Uganda (central). We now know that this race extends eastwards to Elgon, Kitale, Cherangani, and the Mau. We have bred it in numbers and ascertained that there are two forms, typical *cabacus* and the form *amaurus*.

The characters of *cabacus* male are the comparative short fore-wing bar or band which extends from the hind-margin, wide in 1a and rapidly attenuated toward the costa. Of the four examples in Tring, according to Poulton, Op. cit., this bar extends to about mid-way between the hind margin and the apex; one at Oxford has a longer bar, extending to 6. Of material before me (form *Cabacus*) eleven males have the bar extending from 1a-6; two from 1a-5; one from 1a-4. Measured, they are as follows:—

(1) 6 mm. 5 mm. 3 mm. 2 mm. 1.5 mm. 1 mm.	(2) 7 mm. 5 mm. 3 mm. 1.5 mm. —	(3) 7 mm. 6 mm. 4 mm. 2 mm. 2 mm. 1 mm.	(4) 7 mm. 5 mm. 4 mm. triangle 2 mm. 1.5 mm. 1 mm.	(5) 7 mm. 5 mm. 3 mm. quadrate 2 mm. 1.5 mm. „ 1 mm. „
(6) 7 mm. 7 mm. 4 mm. 3 mm. 1.5 mm. 1 mm.	(7) 7 mm. 6.5 mm. 4 mm. lunate 2 mm. 1 mm. —	(8) 6 mm. 4 mm. 3 mm. quadrate 1.5 mm. 1 mm. —	(9) 6 mm. 6.5 mm. 3 mm. 2 mm. 1 mm. —	
(10) 5.5 mm. 7 mm. 4 mm. lunate 2 mm. quadrate 1 mm. —	(11) 6 mm. 4 mm. 3 mm. 1.5 mm. 1 mm. —	(12) 6 mm. 6 mm. triangle 3 mm. 1.5 mm. — —	(13) 7.5 mm. 6 mm. 3 mm. 1.5 mm. 1.5 mm. —	
(14) 7 mm. 7 mm. 4 mm. triangle	1.5 mm. —			



A similar variation is seen in the variety *amaurus*, but in this, the main character is the entire absence of silvery lines on the *underside*. This character appeared as a stable variation in the race *cabacus*, and in no other, until Jackson produced his new material from Katera. Here we are faced with three males and one female, two males strongly lined in silver, and one without. The question then arises, is the variety *amaurus* to be recognised?

My personal opinion is that we must retain the name as indicating a stable variation. It remains to be proved whether or not a similar variation, genetically stable, occurs in the dark Katera race; if so, then one would be justified in creating a new name for such a variety.

In the meantime one can only mention the fact that we have evidence of such a variation.

*CHARAXES EUDOXUS* f. *AMAURUS*. Pl. 19, fig. 4.

Pl. 20, figs. 1 and 2. Pl. 21, figs. 1 and 2.

Ref. Op. cit. No. 33-34, p. 8: Vol. 1, Sep. VIII, p. 176.

In my notes above cited, I referred to this as ? sb-sp. It has now been described by Prof. Poulton under the above name. We are now able to give further notes on the two forms. We have bred a series of both from the same locality, and it would appear that *amaurus* is a variety and not a geographical race. Furthermore, the early stages appear to be identical, or almost so, but there is a puzzling difference in the genitalia, dissection of which I have made; indeed the difficulty is increased in that the genital armature of neither of these, *amaurus* and *cabacus*, agree with that of *eudoxus* given by Poulton, *Trans. Ent. Soc.* 77, 1929, p. 480.

In this form, *amaurus*, the males and females resemble *eudoxus cabacus* on the upperside, but both differ from that race on the underside in that the silvery lines are entirely or almost suppressed, thus bearing a strong similarity to *lucretius*. Pl.                      figs.

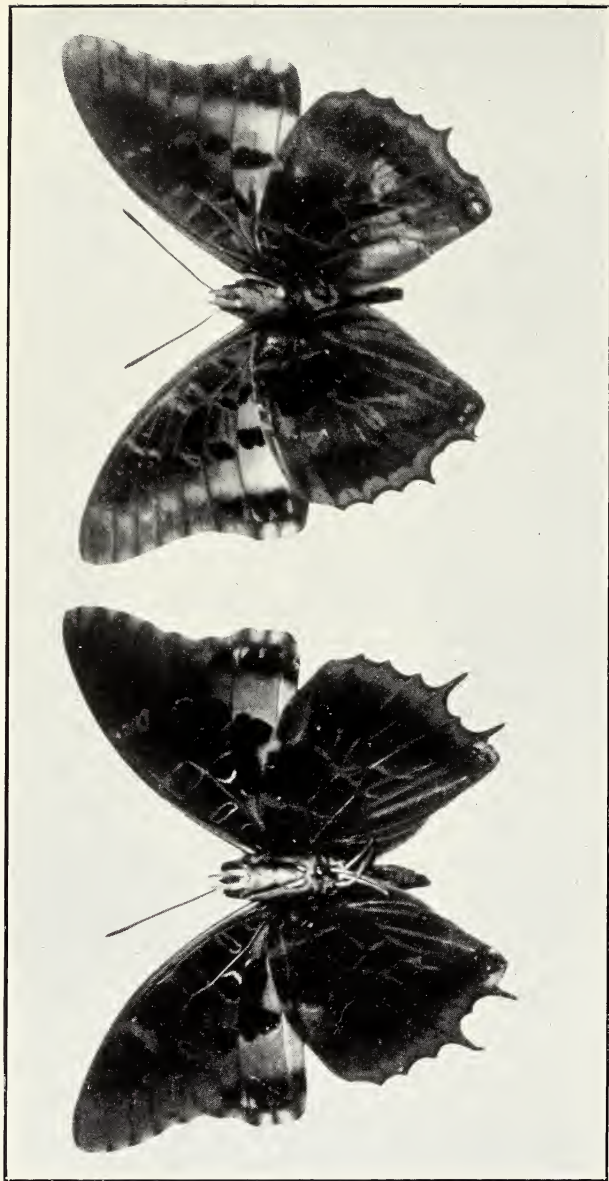
The early stages of both forms are completed and are as follows: The food plants have been provisionally determined as *Syzygium cordatum*, *Syzygium guiniensis*, MYRTACEAE, *Garcinia* sp., and *Schefflera* sp. ARAIACEAE.

The eggs are pearly white when first laid, then the usual brown suffusion spreads from the upper part to the whole and then turns blackish. The shape is rather a squat barrel with round bottom and flattened top ridged, and with a central depression. The young larva hatches in eight days and is olive with very minute whitish papillae (under magnifying glass), black head and yellowish "tails." At the





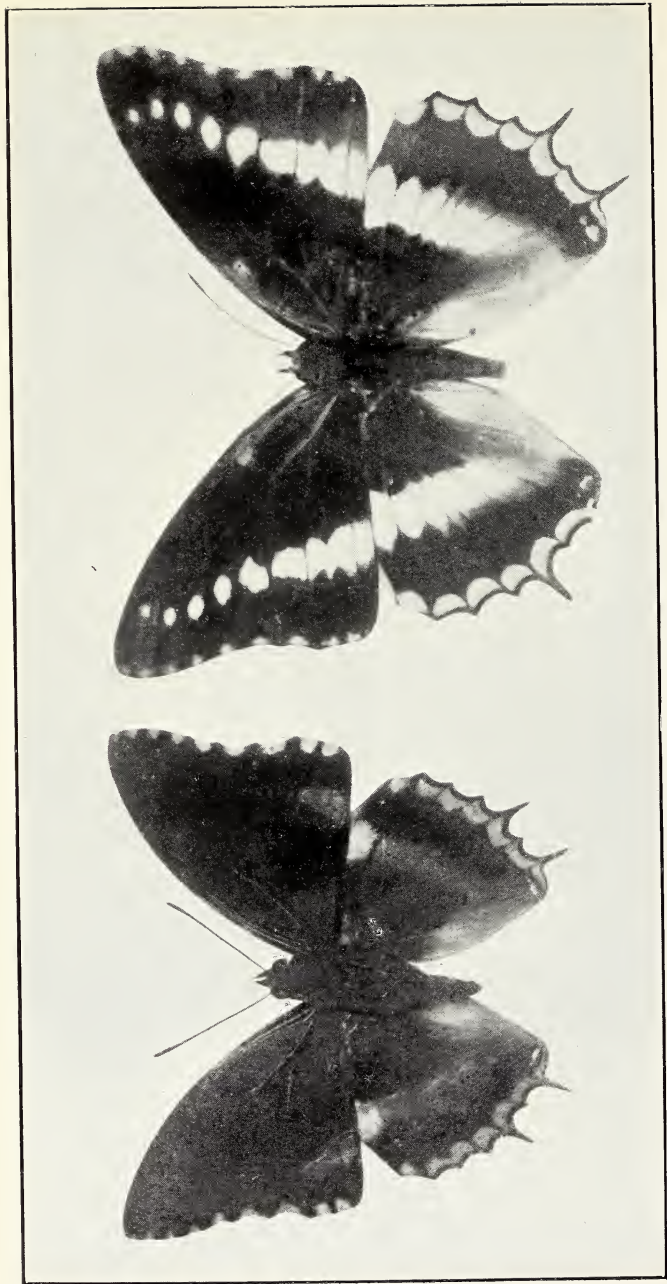
PLATE 21.



*Ch. eudoxus cabacus*, var. *amaurus*. Undersurfaces.



PLATE 22.



*Ch. eudoxus* sb.sp. (Katera Forest). Male and female. Upper surfaces.



PLATE 23.



*Ch. eudoxus* sb.sp. (Katera Forest). Under surfaces.



PLATE 24.



*Ch. imperialis*, Btlr. Male and female.





second instar the greenish colour appears and the pale stippling is more obvious but the tails are less long, and the head now turns brownish with very divergent horns and some greenish centrally on the face. At the next moult, the body is greener, the head is almost entirely green, the horns remain divergent, and rufescent in colour; a yellowish margin appears as a facial line and the intermediate horns are black; the face is strongly rugose and when the larva is about 20 mm. long the next moult takes place. The general colour is now bright green, a small dorsal spot appears on the 6th segment, and the whole body is finely papillated with yellowish points; the head is green and the horns shorter in proportion with the size of the head and not so divergent.

In the final stage the body colour is the same as before, the mark on the dorsum of the 6th segment is a heart-shaped shield in red and green, and on the 8th there is sometimes a second spot. The spiracles are turquoise blue with a yellow central line; the spiracular line is not marked, and the underside of the body is whitish with pink between the segments. The head is uniform green; there are three black spots at the lower angles; the horns are now short and stout, the central pair only very slightly turned inward at the tips, and they may or not be red at the tips; they are usually uniform; the outer pair, however, have well-developed toothed processes some of which are forked. Length 55-60 mm.

The pupa is pale green with a rather frosted appearance due to minute depressions and irregularities on the surface; the spiracles are bluish with a black central streak and brown ring surrounding them.

The cremaster is moderately stalked, has a bilobed rounded process on either side and on the anal segment ventrally there are two ovoid tubercles with brown spots at each end. The pupa of *amaurus* is very similar but there is a yellowish streak on the edge of the wing cases and spots of the same colour on the head.

*CHARAXES EUDOXUS*. Sub.sp., Nov. Pl. 22, figs. 1 and 2.  
Pl. 23, figs. 1 and 2.

This very distinct race of *eudoxus* has recently been taken by T. H. E. Jackson and Mr. Jeffery, in S.-W. Uganda.

MALE: It most closely resembles the race *cabacus* and the form described by Prof. Poulton as *amaurus*. It differs however from both these by the greater extension of the black ground colour of both fore and hind-wings, causing a reduction in the orange-chestnut post-discal bars, especially in the f.-w.

Expanse: 43 mm. F.-w. mostly deep velvety black; basal half of costa, base of wing, bright chestnut; marginal spots orange; the post-

discal bar reduced on the proximal side so that it is indicated by small diffuse chestnut spots in 1a and 1b, and less so in 2 (spots in 2 sometimes absent), set distal to the mid-point.

The black ground colour of the fore-wing may be clear-cut transversely across the apex of the cell, followed by a black transverse sub-apical spot, or the black may extend into the cell with a diffuse line of junction.

H.-w. ground colour black; the basal black area is triangular in outline, apex toward body, remainder of base chestnut paling toward the inner margin. The post-discal chestnut bar is narrow, and crosses the wing from just distal to the mid-line on the costa to above the anal angle; the bar at the costal end is paler than the rest, marginal border with crescentic orange-chestnut spots outlined in black distally; tails black. Lilac spots at anal angle. Abdomen chestnut on back.

Underside: In this race there is the same variation as is found in *cabacus* and the form *amaurus*, that is, the silvery lines may be strongly marked or may be only just indicated. Of the three males sent to me, one is strongly marked, the other has greyish lines, while the third is hardly lined at all, as in the form *amaurus*.

The general tone of the underside is darker and more flushed with purplish than in the other two eastern forms.

FEMALE: This is even more distinctive than the male. It bears a strong resemblance to the female of *Ch. lucretius* on the upper side. It differs, however, from that species in that the upper side of the abdomen is chestnut, not black; the marginal crescentic orange marks of the h.-w. border are narrower, more sharply defined and without a pale spot at the bases; the base of the hind-wing is suffused with chestnut and is not so blackish; the post-discal bars of fore and hind-wings, though of the same ochreous yellow, is edged with rufescent on the hind-wing; the basal chestnut of the fore-wing is greater in extent.

From the females of the race *cabacus* and form *amaurus* this female differs in the greater extent of the black areas in the fore and hind-wings with a reduction in the chestnut areas, the difference of the post-discal bars which are not orange-tawny but creamy with ochreous tinge; the more clear cut crescentic marks on the h.-w. marginal border; the black tails.

The underside differs entirely from *lucretius* and diverges from *cabacus* in just the same way as indicated for the male sex.

Distribution: All the material available is from the Katera forest, where it flies with *lucretius*, and is doubtless influenced by this species.

*CHARAXES VIOLETTA*, Gr. Sm.

Ref. Op. cit. No. 33-34, p. 8-12: Vol. 1, Sep. VIII, pp. 176-180.

To the distribution add Meru Forest. I have received this species from this locality and Messrs. Hamilton Gordon and Berkeley state that the species was very plentiful at Meru in March/April, 1935.

The males do not seem to differ, but the dark areas of the forewings of the females are darker, more blue-black than in coastal examples, especially at the base. It would be interesting to ascertain the food plant in this area. It will lay on *Deinbollia* at the coast.

*CHARAXES TIRIDATES*, Hew.

Add to the food plant: *Chaetacme macrocarpa*, ULMACEAE; *Phialodiscus zambesiacus*, SAPINDACEAE; *Bombax rhodonaphalon*, BOMBACEAE; *Osyris* sp., SANTALACEAE.

*CHARAXES NUMENES*, Hew.

Add to the food plants *Deinbollia* sp., *Phialodiscus zambesiacus*; and *Allophylus macrobotrys* (Uganda).

*CHARAXES AMELIAE AMELIAE*, Doumet.

Ref. Op. cit. No. 33-34, pp. 34-36: Vol. 1, Sep. VIII, p. 202.

Through the kindness of my friend Jackson, I am now able to give a figure of the female of this species. Pl. 26, fig. 1. Pl. 28, fig. 2.

Jackson writes that *ameliae* is the dominant charaxes in the Malabigambo Forest, Sango Bay, and Kagera River.

The early stages are still unknown.

*CHARAXES IMPERIALIS*, Butlr. Pl. 24, figs. 1 and 2.

Pl. 25, figs. 1 and 2.

I am indebted to Jackson for the specimens of this rare species which he has taken in the Malabigambo Forest, Western Uganda, Katera Forest, and Kagera River.

MALE: Expanse 50 mm. F.-w. Ground colour blue-black; one white spot at extremity of cell, two just beyond; a series of eight blue post-discal spots increasing in size and intensity of blue from below the costa to practically the mid-point on the hind-margin in 1a. The spots in 1a and 1b contiguous; small ill-defined light spots at margin.

H.-w.: Ground colour blue-black, wing bar blue and continuous in direction with the fore-wing bar; a sub-marginal row of blue spots



double and small at anal angle gradually increasing in size to sub-costa in 7, the last spot whitish.

Underside: Olive-greyish, cell with wavy black lines outlined with black; white spots of above reproduced below; also post-discal row but small and white, that in 2 and 1b with olive-yellowish distally, the latter with lilac outlined with black internally, also with conspicuous crescentic black marks broadly shaded with lilac; 1b and 2 with narrow black cross lines edged with lilac.

H.-w. ground colour as fore; a series of sub-marginal ill-defined lilac spots, internal to these a further series of olive spots internally edged with lilac; cell and bases of 7-8 with fine black lines outlined with whitish and another series sub-basal in 5 and 6.

FEMALE: Expanse 60 mm., thus much larger than the male. F.-w. ground colour brown-black with some bluish suffusion at the base. Cell with one large spot at apex, distal to it four white spots in 2, 3, 5, 6; post-discal bar blue in 1a and 1b, the latter double and contiguous; an orange spot at distal end of this spot; a further series of orange spots in 2, 3, 4, 5, 6, 7; small double orange streaks at margin from 1b to apex. H.-w. blue-black, slightly greyish at inner fold; discal—post-discal bar blue from 1c through apex of cell and represented in 7 by a white quadrate spot; distal to this an orange spot; a sub-marginal row of orange spots, tinged with lilac at anal angle, extends to 7; marginal border with orange line intersected with black veins and distally black bordered.

Underside: Much as in the male, but spots and lines larger and more distinct.

*CHARAXES HADRIANUS*, Ward. Pl. 27, fig. 1. Pl. 28, fig. 1.

Jackson has sent me a specimen of this species, taken at Katera, August, 1935.

MALE: Expanse 48 mm. F.-w. basal area bright chestnut occupying the greater part of the cell, the base of 1b, and less so in 2, the latter two slightly edged with bluish-green which colour fills the base of 1a. Apical half of wing black from the apex of the cell to the hind angle, central portion of wing creamy with this colour invading the black at the bases of 2, 3, 4; the distal edge of the white patch in 1a-1b where it meets the black, slightly bluish. Two white spots sub-basal in 5 and 6; a further series of five creamy spots in areas 2, 3, 4, 5, 6, diminishing in size from 2-5 then slightly larger in 6. H.-w. creamy, slightly dusky at base; dark line of lower surface shows through intersecting the wing from mid-costa to anal







*Ch. imperialis*, Btlr. Undersurfaces.



PLATE 26.



Fig. 1. *Ch. ameliae*, female.

Fig. 2. *Ch. bipunctatus*, female.



PLATE 27.



Fig. 1. *Ch. hadrianus*, Ward. Upper surface.

Fig. 2. *Ch. brutus*. A curious olive-grey variety with bluish lustre.



PLATE 28.



Fig. 1. *Ch. hadrianus*, Ward. Undersurface.  
Fig. 2. *Ch. amaeliae*, Doum. Undersurface.





angle. A sub-marginal series of black lines from anal angle to 5; margin of wing with fine black line just internal to extreme edge.

Underside: F.-w. apical half silvery; basal half creamy white spots on upper side slightly indicated, but posterior angle with a conspicuous "eye spot" greyish inwardly black distally.

Slight black lines at bases of 1b and 2. H.-w. creamy with slight double black lines in 7 and 8 and through cell. Disc of wing traversed by a chestnut line from mid-costa to anal angle made up of more or less contiguous crescentic marks proximately edged with black. Margin and tails with slight black lines followed by yellowish lunate marks with small black triangles on proximal edge of convexities.

We have no specimen of the female. It is possible that these eastern insects may prove to be a distinct race.

#### *CHARAXES BIPUNCTATUS*. Pl. 26, fig. 2.

We are now able to give a figure of the female. Basal half of fore-wing olive golden, distal half black with a series of white to ochreous spots from just distal to the cell, crossing the wing to the hind angle, the spots in 1b more diffuse black centred and contiguous with double ochreous streaks at margin of 1b. Two white sub-apical spots. H.-w. ground colour olive golden slightly black-scaled at upper angle and narrowly internal to the marginal border of olive-ochreous lunate marks; a black spot at convexity of each lunule picked out in white proximally; a pale olive-ochreous spot at mid-sub-costa, two larger similarly coloured spots in 6-7, extreme edge of wing blackish; tails hardly indicated.

#### *CHARAXES PYTHODORUS PYYHODORUS*, Hew. Pl. 29, figs. 1-2.

Ref. Op. cit. No. 33-34, pp. 36-38: Vol. 1, Sep. VIII, pp. 204-206

We are now able to give the figure of the female of this species, which has been bred in numbers in the Kitale district.

FEMALE: Upperside, very similar to the male, but larger; spots and median bar much more whitish, ground colour more brownish less black. We republish the description of the early stages as recorded by R. T. Evans in Jrl. No. 47-48.

The type of the race *NESEA* came from Mombasa and I have topotypical examples as recorded previously; Rothschild and Jordan however, place the Uganda-Kitale examples as belonging to this race, but they are distinct. It remains to be shown whether or not the Uganda specimens differ from the nominate race or not.

## NOTES ON *CHARAXES PYTHODORUS PYTHODORUS*.

By R. T. EVANS.

### REMARKS ON HABITS OF FEMALE.

I have watched *Ch. pythodorus* ovipositing, and it appears to be its habit to lay not more than four or five eggs on one tree, thus scattering the eggs over a large area. *Ch. pythodorus* is also apparently a very slow layer, taking at least two seconds over each egg. The only specimen of this insect that I succeeded in getting to lay laid eleven eggs and then died. I afterwards examined it, and the eggs were finished! Other specimens which died without laying had from 27 to 34 perfect eggs inside. *Ch. pythodorus* apparently will not lay in captivity unless the cage is in full sunlight.

The laying season would appear to be governed by the young leaf period of the food-plant. As this is very short, and the females will only lay on the young leaves, the laying periods seem to be very restricted.

### EARLY STAGES.

The eggs are large and pearly-white. They are laid, singly as a rule, but sometimes in pairs, on the under or upper surfaces, generally the former, of the young leaves of *Crabia brownei*.\* For 24 hours after laying it remains almost spherical, slightly flattened on top, then the usual depression appears. Twelve hours later, an irregular reddish ring appears round the rim of the depression, with a small red spot in the centre. The lower half of the egg becomes suffused with pinkish-brown. After three days the red markings turn grey-brown. Before hatching the egg turns black. The egg stage lasts eight to ten days.

The young larva is at first uniform olive-brown with a white tail and black head. The horns are white, and give the appearance of a frill. Immediately on emerging the larva eats the egg-shell, and very shortly after starts in search of food. After three days the larva becomes olive-green finely speckled with white. Each white spot consists of a small papillation bearing a minute hair. The head is now dark brown mottled with black. The horns remain white, and are short and broad, all four being of a more or less uniform length. The larva gradually becomes greener, until when it is a week old, the body is grass-green. The tails and horns remain white. When at rest, the larva lies along the mid-rib of the leaf with head raised. Two days before the first moult, in some specimens, a small white dorsal spot appears on the sixth segment. The first moult takes place after

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\* Also on *Crabia brevicaudata*—Leguminosae.—V. G. L. v. S.

ten days. The head is now brown with the lower parts green. In some specimens there is a well-marked dorsal spot on the sixth segment, consisting of a white spot bordered with brown. After the second moult the head becomes green, with mouth-parts black, bases of the lateral horns and tips of the inner horns dark brown, bordered with a pinkish line. The face is bordered with a yellowish line, which becomes broader towards the mouth. The body marks are as follows: A row of yellow dorso-lateral oblique lines from the fourth to the last segment. Each line starts from a spot in the front of each segment, runs obliquely forward through the segment in front of it, and enters the next segment to join a conspicuous white spiracular line. Segments 1 and 2 are without these lines, but have each a spot placed where these lines would start. Segment 3 has a small line, commencing as the others, but not entering segment 2. In some specimens there is a conspicuous dorsal spot on segment 6, in shape like an acorn, creamy-white, bordered with dark brown. It consists of a raised spot, higher at the back than at the front, like a pouch opening backward. In other specimens, however, there is no trace of this spot. The head continues the same in the fourth instar, but after the final moult changes slightly, in that the horns are shorter, thicker, and more upright, and the face is squarer. Throughout the whole larval stage, the body and head are finely papillated with yellow. The mature larva is from 45 to 50 mm. long. When the larva has curled just before pupating, it becomes slightly translucent, and the dorsal spot, when present, becomes pale green.

The pupa is a beautiful object. It is of the usual *Charaxes* form, 25 mm. long, pale green, with yellowish marbling over the dorsum of the thorax. The abdomen is slightly darker, ornamented with purplish spots arranged in a regular pattern. The spiracles are present as a row of purplish marks. The head is bluntly bifid. The only ornamentation on the wing-scutae is a row of four black spots, those on the inside being larger than on the outside. The cremaster consists of a pinkish stalk arising from a base, consisting of two kidney-shaped lobes, ochreous in colour. Two small blackish spines arise at the base, and lie along the abdomen, pointing forward. The abdominal segments are produced backward, forming almost a hump.

*CHARAXES ANSORGEI ANSORGEI.*

Ref. Op. cit. 31-32, pp. 153-156.

*CHARAXES ANSORGEI JACKSONI*, Poulton.

There are two distinct races of this species within Kenya and a possible third; the typical nominate race is found west of the Mau, roughly speaking; the second east of this range of mountains, and the



third in the Meru district. In Uganda, the race *ruandana* occurs. Material was placed at the disposal of Professor Poulton, and he has made a critical examination and published his results in *Stylops*, Vol. 2 pt. 1, Jan., 1933. With the permission of the author and the Royal Entomological Society we append the full notes and make use of the plates which he has kindly presented to the Society.

The Kenya races have been bred in numbers, the eastern race feeds on *Bersama abyssinica*, the western race on *Bersama engleriana*,  
MELIANTHACEAE.

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## THE GEOGRAPHICAL RACES OF *CHARAXES ANSORGEI*, ROTHSCH. (LEP. NYMPHALIDAE).

Plates 30 and 31.

By EDWARD B. POULTON, D.Sc., F.R.S., Hope Professor of Zoology  
in the University of Oxford, Fellow of Jesus College, Oxford.

An account of the geographical distribution and mimetic associations of four subspecies of *Charaxes ansorgei*, together with some addition to our knowledge of their behaviour in life, appeared in 1932 *Proc. Ent. Soc. Lond.*, 7: 6-9, where it is stated on p. 8 that figures, with brief descriptions of the new forms, would it was hoped, "be communicated to *Stylops* in the near future." Hence the present short paper.

1. *Charaxes a. ansorgei*, Rothsch.—Plate 1, fig. 1—♂; fig. 2—♀. The male was described by Lord Rothschild in 1897 *Novit. Zool.*, 4: 181-182, and figured in 1898 *ibid.*, 5, pl. v, fig. 2. The female hitherto associated with this male is that of the next race, the true female being undescribed. Figure 2, reproduced from Mr. Alfred Robinson's excellent photograph, shows that the pattern of this female resembles that of the male and differs from the females of other known races of *ansorgei* in the tint of the F.W. discal band being orange instead of white. It is, however, paler than that of the male, especially so in area 1 where it becomes nearly white in some examples. Because of its paler tint this band stands out more prominently than that of the male, the difference being exaggerated by photography—so much so indeed that it became necessary to colour this marking in the print selected for reproduction. The dark, tawny marginal F.W. spots and sub-marginal H.W. spots are much reduced as compared with those of the male. Apart from this latter difference, the greater size of the female, its paler F.W. band, straighter F.W. outer margin and the wider black marginal area of both wings, the sexes of *a. ansorgei* are very similar in appearance.

The H.W. tails of both male and female are shorter than in the next race, a difference very clearly shown in pl. 1. In its paler tint





PLATE 29.



*Ch. pythodorus pythodorus*, Hew. Male and female.



PLATE 30.

*CHARAXES ANSORGEI ANSORGEI*, Rothsch., ♂—1, ♀—2, N.E. Uganda  
and Kenya, W. of Rift Valley;  
*C.A. JACKSONI*, subsp. n. ♂—3, ♀—4, Kenya, E. side of Rift Valley.









PLATE 31.

*CHARAXES ANSORGEE RUANDANA*, Talb., ♂—1, ♀—2, N.W. and N. of  
L. Tanganyika, and W. Uganda;  
*C.A. LEVICKI*, subsp. n. ♀—3, ♂—4, L. Nyasa, ♀ from Manow, N. of Lake.







PLATE 32.



*Ch. zoolina-neanthes*, female and male, showing colouration of both seasonal vars.





and greater sensitiveness to actinic rays it would appear that the F.W. band of the female has already advanced in the direction of the white band of the other *ansorgei* races. There can be no doubt that, as regards this feature, it represents the ancestral form from which the others have directly or indirectly evolved.

Length of F.W. of specimens represented on pl. 1, fig. 1, ♂—41.0 mm.; fig. 2, ♀—47.5 mm.

The following examples were studied in the preparation of the above account:—

N.E. Uganda: S.W. of Mt. Elgon, Mt. Kokanjero, 6,400 ft., 7-9 Aug., 1911 (*S. A. Neave*), ♂ ♀, Brit. Mus.; W. slope of Mt. Elgon, N. Bugishu, c. 7,000 ft., Bulago, 26 Dec., 1928 (*G. D. Hale Carpenter*), ♀, Hope Dept., O.U. Mus.; ditto, Butandiga, 30 Dec., ♂; 1-4 Jan., 1929, ♀; 7 Jan., ♂.

Kenya Colony: E. slope of Mt. Elgon, Kitale, 1926, ♂, Nairobi Mus.; ditto, Sept., 1931 (*T. H. E. Jackson*), ♀; ditto, 1930, Herbst, ♂, Coll. J. Levinsk (ex Coll. Oberthür), here represented on pl. 1, fig. 1; ditto, Nov., 1930, ♂, Coll. Mme. Fournier; Trans-Nzoia, 15 miles E. of Mt. Elgon, 1,500 metres, 1930, Herbst, ♂, Coll. Mme. Fournier; ditto, ♂, Brit. Mus. (ex Coll. J. J. Joicey); Nandi Country, Patsho, 11 Dec., 1896 (*Dr. J. W. Ansorge*), ♂, Tring Mus., Type, Rothsch. 1897 (Novit. Zool., 4: 181; 1898, 5, pl. v, fig. 2); W. slope Mau Escarpt., 7,000 ft., Lumbwa, Aug. 1920 (*H. L. Andrewes*), ♀ (perhaps bred, but nearly as large as the captured specimens), Hope Dept., O.U. Mus., here represented on pl. 1, fig. 2, Allotype; ditto, Dec., 1920, ♀, a very small specimen, probably bred. In addition to the above, two males in the Hope Dept., labelled "Nairobi, E. Afr. Prot., 17.v.1903," were collected by Mr. A. H. Harrison. These specimens, which agree with the type of *C. a. ansorgei*, were probably collected on the west side of the Rift Valley.

2. *Charaxes a. jacksoni*, subsp. n.—Plate 1, fig. 3—♂; fig. 4—♀. This sub-species has been carefully described, together with its life-history, by Dr. V. G. L. van Someren and Canon St. Aubyn Rogers, in *J. E. Afr. & Uganda Nat. Hist. Soc.*, 31-32: 153-156; pl. lxxi, figs. 1-4; lxxv, figs. 4, 5; lxxvi, figs. 11-13; also the female by A. G. Butler in *Proc. Zool. Soc.*, 1900: 915. Both these publications assumed that this race did not differ from *a. ansorgei* on the W. side of the Rift Valley. It is, however, evident that the material described in the E. African Journal was chiefly of the eastern race, having been collected near Uplands on the Kikuyu Escarpment, or bred from eggs or larvae obtained in the same locality. The distinctions pointed out below taken in connexion with the published descriptions and with the excellent figures on plate 1, provide means for the easy identification of this race of *ansorgei*.

MALE.—Three closely similar examples of this sex have been kindly sent to me by my friend Dr. V. G. L. van Someren. They resemble on both upper and under surfaces the figures published in the *J. E. Afr. & Uganda Nat. Hist. Soc.* (31-32: pl. lxxi, figs. 3, 4). So far as I am aware no other males of this race exist in European collections.

When figs. 1 and 3 of pl. 1 are compared it is at once obvious that the F.W. band of *jacksoni* (3) is much narrower than that of *ansorgei* (1), the black marks in the orange patches of areas 1b, 2, and 3 much larger, and the four orange spots beyond area 3 with the 2 others set at an angle with them, much smaller. The whole band, although narrower, stands out far more prominently than in *ansorgei* because of the much darker tint of the basal rich chestnut brown which deepens into black as it approaches the inner border of the chief marking. The darkened wing surface within the bar results in the two black spots of the cell becoming far less distinct than in *ansorgei*.

The F.W. marginal and the H.W. sub-marginal spots are smaller although the difference is not great. The H.W. tails are slenderer and much longer.

The H.W. under surface is characterised by the narrowness of the white band and especially by the nearly straight line followed by it and the four black marks along its inner border, in areas 1c, 2, 3 and 4. This part of the pattern appears to be a very convenient and distinctive feature, although only applicable to the males.

FEMALE.—The difference between the patterns of these two races has already been pointed out under *ansorgei*. The greater prominence of the bar is not only due to its whiteness but, as in the male, is greatly enhanced by the dark tint of the basal surface of both fore- and hind-wings, especially the former. The H.W. tails are longer and stouter.

Length of F.W. of specimens represented on pl. 1, fig. 3, ♂—41.0 mm.; fig. 4, ♀—52.5 mm. It must be remembered that the ♂ being bred is probably much smaller than a wild example.

EXAMPLES STUDIED:—Kenya Colony: Aberdare Mtns., E. foot and slopes, 7,000-8,500 ft., 24-27 Febr., 1911 (*S. A. Neave*), ♀, Brit. Mus.; Kikuyu Escarpt., nr. Uplands, Uganda Rly., 7,500-8,000 ft., Apr., 1926 (*V. G. L. van Someren*), 3 ♂♂ (probably all bred, 2 with pupa-cases), one represented on pl. 1, fig. 3, Type, 3 ♀♀ (all much smaller than pl. 1, fig. 4 and probably bred, 2 with pupa-cases), Hope Coll., O.U. Mus.; Kikuyu Forest, Roromo, 16 Dec., 1899 (*R. Crawshaw*), ♀, Brit. Mus., Type of Butler's description of *Ch. a. ansorgei*, ♀, in 1900 *Proc. Zool. Soc.*, 1900: 915, here represented on pl. 1, fig. 4, Allotype of ♀ *jacksoni*; ditto, 22 Jan., 1900, ♀, Tring Mus.

This interesting race is named in honour of Mr. T. H. E. Jackson, F.E.S., of Kitale, who first recognised the difference between the races of *ansorgei* on the two sides of the Rift Valley (1932 *Proc. Ent. Soc. Lond.*, 7: 6).

3. *Charaxes a. ruandana*, Talb.—Plate 2, fig. 1—♂; fig. 2—♀. This race was described from the only known ♀ by Talbot in 1932 *Bull. Hill Mus.*, 4: 289, and given the name *ruandana* because the locality, Kabira Forest, was stated by the captor, T. A. Barns, to be in Ruanda. If this is correct it must be, as Mr. Talbot writes, "in the southern corner of that area," inasmuch as the label furthermore records that the forest is 12 miles N. of Usumbura at the N. end of Lake Tanganyika. The males, except one, were taken rather further S. than the female, and the single example much further N., on the Congo border of W. Uganda.

MALE.—The F.W. band and indeed the whole wing resemble *jacksoni*, but the four post-discal spots and the two within them are somewhat larger, although smaller and more sharply defined than in *ansorgei*. The degree of development of the black marks in the orange constituents of the band in areas 1a, 2 and 3 is also intermediate between the darker *jacksoni* and the less dark *ansorgei*. The F.W. marginal spots are also intermediate but, in this respect, there is very little difference between the three races.

The narrowing of the anterior section of the H.W. band affords the most conspicuous distinction between the male *ruandana* and the other races, as may be seen at a glance when fig. 1 on pl. 2 is compared with 4 (*levicki*), and with 1 (*ansorgei*) and 3 (*jacksoni*) on pl. 1. This distinction, although very evident, is less marked in the other males of *ruandana*. In this, as in other respects, the male of *ruandana* is nearest to *jacksoni*, although the posterior section of the band in this latter is much broader, due to the spread of its inner border over the basal surface. The sub-marginal spots resemble those of *jacksoni* and are distinctly smaller and less developed than in *ansorgei*.

The beautiful and complex pattern of the F.W. under surface in this and the other races of the species was found to be so variable when a fair series was examined that, except in *jacksoni*, it became inexpedient to found any characters on its appearance in the single or very few examples which alone were available in all except *ansorgei*. There is, however, one striking feature, pointed out to me by Mr. Talbot, on the under surface of the hind-wing of *ruandana* ♂ in which the white band is much beyond the cell in area 4. The interruption is less and the mark less rectangular in a male from W. Uganda which, in this and other respects, is somewhat transitional



towards *ansorgei*. In the narrowness of the H.W. band on the under surface *ruandana* resembles *jacksoni*.

**FEMALE.**—The F.W. band is narrower than in the females of the other races and the whole effect of the upper surface more black-and-white and *brutus*-like. The spots of the post-discal series are obsolescent except the anterior one which is distinct and white, not orange as in the other races. The almost complete suppression of the F.W. marginal as well as the H.W. sub-marginal markings is another distinctive feature well brought out in the figure (pl. 2, fig. 2). The contrast in this respect with the female *jacksoni* (pl. 1, fig. 4) is very strong. The pale white and bluish H.W. band is also narrower than in the other races. The tails of both sexes appear to be intermediate between those of *ansorgei* and *jacksoni*, but in order to reach safe conclusions on this and other points a longer series of specimens is required.

Length of F.W. of specimens represented on pl. 2, fig. 1, ♂—40.0 mm.; fig. 2, ♀—48.75 mm.

**EXAMPLES STUDIED.**—Virgin forest behind the shore mountains of N.W. Tanganyika, 18-2,200 metres, Grauer, ♂ Allotype, Brit. Mus. (ex Coll. J. J. Joicey), represented on pl. 2, fig. 1; L. Tanganyika, N.W. shore, 1,900-2,100 m., Febr., 1910, Grauer, 2 ♂, Coll. Mme. Fournier and Tring Mus.; 12 m. N. of Usumbura at N. end L. Tanganyika, Ruanda Distr., Kabira forest, 7,000 ft., Jan., 1924, Wet Season (T. A. Barns), ♀, Type of Talbot's description in 1932 *Bull. Hill Mus.*, 4: 289, Brit. Mus. (ex Coll. J. J. Joicey), here represented on pl. 2, fig. 2; W. Uganda, Congo border, Mar.-Apr., 1926 (E. Barns), ♂, Brit. Mus. (ex Coll. J. J. Joicey).

In addition to the above my friend M. le Cerf has kindly shown me a ♂ in the Paris Museum which appears to be quite distinct from *ruandana* as here described and figured. It was taken at Kitembo, Lake Kivu, E. Belgian Congo, Nov., 1931. It is possible, but I think unlikely, that this form is the ♂ of *ruandana*. The F.W. band is much broader and more heavily marked with black than in this latter race, the post-discal F.W. spots rather larger and continued posteriorly as far back as area 1a, the marginal F.W. spots more developed, the H.W. band also much broader and with no marked constriction towards the costa. More specimens, especially females, from the same area would be extremely interesting.

Since the above paragraph was written M. Le Cerf, who had been travelling in Morocco, returned to Paris and very kindly sent me the following particulars of the six males, including the one mentioned above, which have now been received from Kitembo:—



“ Voici tous les détails de nos étiquettes :—

“ Bulira, Kitembo, Lac Kivu, xi.1931, 1 ♂ ; viii.1932, 1 ♂ ; xi.1932, ♂♂.

“ Lushasha, Kitembo, Lac Kivu, viii.1932, 1 ♂.

“ Kirondo, Kitembo, Lac Kivu, ix.1932, 1 ♂.

“ Tous ces exemplaires sont bien pareils entre eux, notamment pour la largeur de la bande terminale noire des ailes antérieures qui est notablement plus étroite que la bande fauve discale. Le No. 4, qui vient d'arriver et est encore sur l'étaioir, a les points fauves subterminaux des ailes postérieures un peu plus grands que chez les autres individus, mais il ne s'agit évidemment que d'une très faible modification individuelle, nullement raciale.

“ Lushasha, Kirondo et Bulira, sont très rapprochées l'une de l'autre dans la vallée de la Luzira, petite rivière qui se jette dans le lac Kivu, entre Bobandana et Katana. Elle descend des montagnes boisées, parallèles au Lac, qui forment en majeure partie la région du ‘ Kitembo.’ Les chasses ont été faites à l'altitude de 2.500 mètres environ, mais il y a des sommets atteignant 3.000 mètres à proximité immédiate.

“ Tels sont les renseignements que je possède actuellement. Je souhaite qu'ils vous soient utiles et vous parviennent encore à temps pour que vous puissiez les inclure votre travail.—F. LE CERF.”

4. *Charaxes a. levicki*, subsp. n.—Plate 2, fig. 4—♂ ; fig. 3—♀. This race is described from a ♂ and ♀ kindly lent to me by Mr. J. Levick, F.E.S., after whom I have the pleasure of naming it. But for the locality I should have hesitated to suggest that they belong to the same race, the ♀ being so much like *jacksoni* and the ♂ so very different from any known form of *C. a. ansorgei*, the female being among the largest and the male by far the smallest in any of these races.

MALE.—The outer margin of the F.W. is deeply excavated, and the anal areas more prominent than any other male of *ansorgei*. The F.W. marginal spots are very strongly developed in area 1a, much less so in 2, 3, and 4, and again more strongly in 5 although far from attaining the size of the two in 1a. Thus the effect is that of a highly irregular series quite unlike any of the other males known to me. The band is very broad and the black markings within it, in areas 1a, 2, and 3, are nearly as in *ruandana*, but the post-discal spots are larger than in the latter race and about equal to those of *ansorgei*. The F.W. basal area is lighter in tint than in any other male of the

\* Where the number of plates is referred to in the text read 30 and 31 in place of 1 and 2.—Editor.

species, but the black markings along the internal border of the band contrast strongly with its pale orange-brown colour.

The H.W. pattern is very different from that of any known male of *ansorgei*. The band which, up to vein 7, is bluer than in other races, takes on a tawny tint in areas 7 and 8, the two marks being separated from each other by strong pigmentation along the vein, while the bluish-white mark in area 6 is much reduced, forming a marked constriction between the two sections. The whole effect is very characteristic and unlike the other races. The sub-marginal spots are also much larger as is the green marginal mark at the anal angle of the wing. On the under surface, the H.W. band is not narrow as in *ruandana* and the mark beyond the cell is small and causes hardly any constriction.

The female upper surface closely resembles *jacksoni*, but the basal area is even darker and the band whiter, so that the mimetic likeness to *brutus* is stronger. The F.W. post-discal spots are considerably larger than in *jacksoni* and the sub-marginal H.W. spots rather smaller.

Length of F.W. of specimens represented on pl. 2, fig. 4, ♂—37.0 mm.; fig. 3, ♀—50.0 mm.

EXAMPLES STUDIED:—Lake Nyasa, E. Africa, No. 969, ♂, Coll. J. Levick (ex Coll. Oberthür), Type; Manow, N. of L. Nyasa and E. of New Langenburg, No. 970, ♀, Coll. J. Levick (ex Coll. Oberthür), Allotype.

#### CHARAXES ZOOLINA-NEANTHES.

Ref. Op. cit. No. 33-34, pp. 39-41: Vol. 1, Sep. VIII, pp. 207-210.

We take this opportunity of publishing a figure of two intermediates between these forms. Pl. 32, figs. 1 and 2.

#### CHARAXES EUPALE DILUTUS, R. & J.

To the food plants of this species add *Albizzia sassa* and *Albizzia grandibracteata* in the Kitale district (Jackson).

#### CHARAXES ZINGHHA, Stoll.

Ref. Op. cit. No. 33-34, pp. 49-50: Vol. 1, Sep. VIII, pp. 217-218.

We have now bred this species. The food plant is "Kyasira" (Luganda), *Hugonia platysepala*, Welw., LINACEAE, a climber which has a series of hooks along the branchlets to enable it to retain a hold on its supporting tree. The eggs are a squat barrel shape with rounded base and flat top which is strongly fluted radiating from a raised central point. The young larvae are olive with black head and

strongly bifid yellowish "tail." Even at this stage, the horns are characteristic. The larva turns greenish at the first moult and is slightly papillated. The second moult takes place within a week and the head then becomes green with rufous horns and a line of the same colour around the disc. At the third moult the head is very similar to that of the final instar of the larval stage; the lower edge is square, the lateral horns are short and incline inward at the tip, the two long horns are directed outward and then curve inward; these horns are ochreous and an ochreous line surrounds the face. The lateral intermediate horns are only slightly indicated. The facial disc is a strong green and there are two dark oblique lines above the mouth; the central fissure between the lateral lobes is marked. The body colour is now deep green with a lateral line well developed and the tails are broadly bifid. In the final stage the larva reaches a length of 55 mm. It is a deep green with strong papillation in yellow, a strong lateral line of the same colour, and the lateral aspect of the body has decided rounded tubercles, dorsal spots on the 6th and 8th segments are indicated by a slightly raised area of deeper green centrally blue with red dots or grey with a bluish outline; sometimes the spots are obscured. The tail is still broadly bifid and yellowish. The head, figured on Pl. CVII is somewhat reminiscent of that of *varanes* or *fulvescens*, yet has some similarity to *Euxanthe*. The disc is green with an ochreous line running from the bases of the long horns to the outer angles of the mouth parts; the lateral aspects are widely yellowish; the lateral horns are short, strongly rugose; the central pair long, divergent for the basal half, then strongly curved inward, very rugose and ochreous in colour; the central intermediate horns are short, rugose and ochreous and there are no intermediate lateral horns. The posterior aspect of both lateral and long central horns are strongly spined.

Pupa: Of the usual charaxes type, perhaps slightly more ventricose, pale green with little ornamentation; such as is present is whitish and irregularly placed over the dorsum of the abdomen and on the wing shields, and on the head tubercles. The head is square with slight projections.

Rothschild and Jordan suggest an affinity to *Ch. etesipe*, but in view of the larval characters it would appear rather different.

A study of the larval characters of the group would well repay study and help in the sub-division into sub-families and genera.

#### CHARAXES ETESIPE.

Ref. Op. cit. No. 33-34, pp. 50-54: Vol. 1, Sep. VIII, pp. 218-222.

Add to the food plants of the nominate race, *Dalbergia* nr. *lacteata*, also *Entada abyssinica*.

I was recently informed by Messrs. Berkeley and Hamilton Gordon that they had taken this species at lower Meru forest.

I have now had the opportunity of examining a small series of some six specimens. On the upper surface these specimens resemble the race *tavetensis*, but on the underside, the ground colour is paler, much less ochreous tinged, and as all are constant in this respect I propose to name a local race as follows:

*C. etesipe* GORDONI, sub.sp. nov. Type male, Meru forest (lower), 2,500 feet, in the Coryndon Memorial Museum. H. Gordon and Berkeley. Six specimens compared with a series of nominal typical *etesipe* and a series of *tavetensis*.

The following food plants should be added under the respective species:

#### CHARAXES CANDIOPE:

*Croton alienus* Pax, EUPHORBIACEAE.

Occasionally in the Nairobi area.

*Croton dichogamus* Pax.

In the Machakos and Ngong areas on stony ground, and at the coast.

*Croton jatrophaoides* Pax.

At the coast.

*Croton pseudopulchellus* Pax.

At the coast.

*Croton macrostachys* Pax.

Elgon to Nairobi area.

#### CHARAXES POLLUX:

*Fluggea microcarpa*, EUPHORBIACEAE.

Jinja.

*Bersama engleriana*, MELANTHACEAE.

Uganda and Kitale area.

#### CHARAXES BRUTUS:

*Bersama abyssinica*, MELANTHACEAE.

Kikuyu escarpment.

*Fluggea microcarpa*, EUPHORBIACEAE.

Uganda.

*Ekebergia rueppeliana*.

Elgon area.

*Turraea holstii*.

Elgon area.



CHARAXES VIOLETTA:

*Deinbollia kilimanjarica*.  
Coast and Meru.

CHARAXES CITHAERON:

*Grewia* sp. and " *Mutoro* " sp. indet.  
Meru district.  
*Afzelia cuanzensis*, LEGUMINOSAE.  
Coast.  
*Crabia brevicaudata*, LEGUMINOSAE.  
Elgon area.

CHARAXES NUMENES:

*Allophylus macrobotrys*.  
Uganda.  
*Deinbollia* sp.  
Elgon area.  
*Phialodiscus zambesiacus*, SAPINDACEAE.

CHARAXES TIRIDATES:

*Phialodiscus zambesiacus*, SAPINDACEAE.  
*Bombax rhodognaphalon*, BOMBACEAE.  
*Osyris* sp. indet.  
Kitale.

CHARAXES EUPALE:

*Albizia grandibracteata*, LEGUMINOSAE.  
Elgon area.

CHARAXES ETESIPE:

*Dalbergia* sp.  
Kitale area.  
*Cassia* sp.  
Kitale area.  
*Entada scadens*, LEGUMINOSAE.  
Rabai area, coast.  
*Entada gigas*.  
Coast.  
*Entada abyssinicus*.  
Kitale area.  
*Afzelia cuanzensis*, LEGUMINOSAE.  
Coast.

# FUTURE DEVELOPMENT OF THE KIPSIGIS WITH SPECIAL REFERENCE TO LAND TENURE.

By I. Q. ORCHARDSON.

*(Lecture given at the East Africa and Uganda Natural History  
Society.)*

## INTRODUCTION.

I hope this subject will not lack interest because I am treating it from a local point of view. It is a problem which will arise or is arising all over East Africa.

One of my reasons for treating it from the local standpoint is that I believe that there is no one general solution for all the tribes of East Africa but that the treatment will require to be different according to the various native laws and customs on the subject.

Another reason is that if one undertakes to propose solutions of other people's problems it is as well to know something about those people. No one man can know all the different East African tribes so that contributions from those who have local knowledge of particular tribes may be of some value in treating the general problem.

Since the Kipsigis recently attained notoriety on account of certain serious crimes and the removal of a clan which subsisted by the organisation of crime, perhaps most of you think of the Kipsigis as a very "lawless" tribe. I wish to begin by saying that this lawlessness of a minority has in no way lessened the high opinion I have of the character of the people as a whole. Because crime and dishonesty occur in New York or London we do not damn the whole population as "lawless," but rather sympathise with the law-abiding who suffer from the presence of the criminal and dishonest.

Furthermore we must remember that we came uninvited, took over the government of these people by force. Having made war upon them, we are surprised nevertheless that they do not understand at once that they must not do so.

Mind you, I do not assert that we are wrong necessarily in assuming rule over others, but we ought not to be surprised if some of our unwilling subjects do not at once appreciate our point of view.

By imposing the *Pax Britannica* we have taken away their chief occupations and a large part of their livelihood and amusement, for not only did we stop their wars but also took government and the administration of justice out of their hands. The first step was right and necessary though a little illogical to them perhaps. The second step was surely unwise, but if we decided that we were right in taking every kind of local administration out of their hands we

surely ought to have seen that having taken away most of their occupations we must find them new ones of which we could approve. In the early days of British rule, however, it was considered sufficient to say "go out and work for a wage so that you can pay tax."

Fortunately we are now waking up to the fact that we cannot expect people to be contented law-abiding tax-paying citizens unless we teach them how to become so, under the new conditions.

We are now seeking remunerative occupations for them. But let us keep in mind two things.

(1) That the occupations must be ones that they like.

(2) That tastes differ and we cannot force all to one pattern and even if we could it is not desirable either for economic or other reasons.

For example it is not sound policy to say "Maize is a simple crop, with an unlimited market; all of you go and plant maize." For it is not everyone who wishes to or can dig all day with a jembe, and it is not every one who has oxen and can afford a plough. And again, when too many grow maize the price falls locally to say Shs. 2/- a bag. Furthermore, before large quantities of maize can be grown, transport, market and milling must be organised.

We must teach them to grow other crops than maize and incidentally learn to appreciate ourselves some of the valuable qualities of the *wimbe* we so despise.

Then again, why try to force all to agriculture when the Kipsigis are a pastoral people loving their herds and flocks and valuing them quite as much (and for similar seasons) as we do our bank accounts, investments, or landed property.

Surely one of our first cares should be to help them to improve their livestock, improve their grazing, and then make more use of their products.

Leaving aside, then, other educational matters, as well as games, sports, etc., which are all necessary to the making of happy law-abiding citizens, let us try and look into the future and see what precautions we must take whilst making the people good agriculturists and pastoralists.

Remembering that the laws of the Kipsigis have developed to suit a primarily pastoral people, it is obvious that as we teach them to put more land under cultivation, to improve grazing and stock a new set of conditions will arise and at the same time as they learn better hygiene and receive medical attention, an increase of population and of livestock will take place. Their laws will have to adapt themselves to these new conditions. But as these changes are imposed

from without they will occur with greater rapidity than if they were the result of slow self development from within. Hence difficulties will arise over the law and we shall be inclined to alter their laws to the European pattern.

Before doing so hastily I suggest that we ought to consider their own laws and see what is good in them, from their point of view rather than ours, and retain as much as possible of them. Again we must examine our own laws and admit what is not satisfactory in them and avoid producing amongst these people conditions which have proved unsatisfactory in Europe.

Remember that we are unconsciously prejudiced in favour of our own laws, and many of us know no others and are apt to despise or condemn the forms of society which other nations have developed especially if they are not so far advanced as we are in the arts and sciences. Even if our laws and forms of society are indeed those best suited to ourselves in our present state of development, it by no means follows that they are best for others, who have a different environment and background as well as differing from us mentally and morally.

Let us consider the Kipsigis idea of property. A man's property (or a woman's) is that upon which he has done work, which he has acquired by his own effort, e.g. the tree he has felled for firewood or honey boxes, the house he has built, the grain he has planted, the cattle he has raided or bought with his own property.

That which occurs naturally is given by God to all equally, the earth, the grass, the trees, the salt lick, the wild animals. These only become a man's property when he has done work upon them.

The land never becomes the property of an individual: it is the property of the tribe. But so long as a man keeps a piece of land in cultivation he has the right to use it, but as soon as he leaves it to go back to bush or grass it becomes public property again.

When he dies a man's personal property is inherited by his sons equally (with a few trivial exceptions). But this is not really the personal property of the sons now but the entailed property of all his descendants. The sons have the right only to the use of this inherited property. They may not dispose of it out of the family, except as the marriage gift.

The chief form of property is of course cattle, sheep, and goats, for there is no property in land.

One of the important results of this community of land is that everyone has the means of subsistence; there are no landless and little disparity between rich and poor, no classes. Every one has land to cultivate, land to graze, land to build a house upon and the material



for building, fencing, and making most of the essentials of their simple life.

In fact they are truly a free people.

Now consider the corresponding situation amongst Europeans. We have allowed the land to fall into the hands of a few, so that we have classes of landed and landless, rich and poor, those who must work every day for someone else or starve, who have no house of their own. Nine out of ten of us are at the mercy of a landlord and an employer. In fact we have lost that freedom we are so fond of talking about. We have sacrificed it to what we call progress.

In our anxiety for Africans to progress, that is to produce, let us try to avoid robbing them of freedom or allowing them in ignorance to barter it away for some less valuable form of wealth.

Most of us Europeans are so accustomed to the unjust concentration of the land in the hands of a few that we regard it almost as a natural phenomenon like the procession of the seasons. We have, however, rebellions and revolutions of the past and the Bolshevik experiment of to-day to remind us that human nature sometimes protests strongly against the injustice which has arisen largely as a result of the development of landed and landless classes.

Now is it possible to retain the equal right of all to the land and at the same time to develop the agriculture and pastoral industry of the Kipsigis so that they may acquire sufficient wealth to obtain such of the benefits of civilization as may contribute to their happiness.

The desire for the maximum of freedom is doubtless a matter of temperament. Personally I would not sacrifice freedom or advise others to do so for the sake of accumulating wealth, more especially when one considers that the apparent wealth of a nation usually accumulates in the hands of a minority leaving the rest with neither wealth nor freedom.

So long as only annual crops were cultivated and that on the small scale possible by the hand labour of each family, the community of land was undoubtedly the best possible arrangement. But with the growth of ambition, inspired by European example, the employment of more efficient instruments of cultivation, and the introduction of perennial crops such as trees for fuel and building, wattle for bark, fruit trees, etc, this arrangement may no longer be possible at any rate in its simplest form.

If this most valuable of human assets is not to be lost we must take special precautions to retain it.

The common ownership of land does not prevent a man from extending the area that he cultivates, neither does it apparently in

practice prevent him from planting more or less permanent products such as trees. But as the scale of agriculture increases it becomes more and more difficult to fence. The Kipsigis law at present is that a man must fence his field or he cannot complain of the trespass of livestock, a very natural law amongst a people who are primarily pastoral. Not only would such fencing on a large scale become burdensome to the man with large fields, but if it were enforced so that permanent fences were put up it would probably lead to the cultivator asserting his permanent right to that land; in fact private ownership of land would be inaugurated and the more progressive and aggressive would rob the remainder of their land much as happened in England at the time of the "enclosure of lands."

The same thing would happen where a man improved the grazing or planted grasses or other fodder, and introducing better stock, fenced them in against the approach of tick carrying stock or rinderpest from other areas.

However if agriculture is to increase and stock be improved it is certain that fencing will be introduced. Foreseeing this, what we have to do is to make laws that will prevent the land falling into the hands of a few and thus producing a class of poor landless people at the mercy of a fluctuating labour market where the wages are only sufficient for those with their own homes and food supplies.

Incidentally those employers who have visions of excess of cheap labour under such conditions must realise that the wages of labour would rise enormously for the present rate of wages is made possible by the fact that nearly every labourer has his free home and his source of food so that his wage is only to pay his tax, to add to his property, or tide him over a period of shortage of food in his home. It is not a wage upon which he could live if he had not a free home and land.

As we teach a primarily pastoral people to put larger and larger areas under cultivation not only does it become more and more impossible for the owners of fields or stock to fence their individual fields or flocks but other new difficulties arise.

For example under the old method of hand cultivation and retaining a field in cultivation only one or two years, there was little erosion or impoverishment of the soil. But when ploughs and harrows are used erosion at once begins to occur as I have found to my cost. Further, when large areas are cultivated one cannot break up new areas every year or two years. If one continues to crop a field year after year without manuring, a time arrives when the land is too impoverished to produce remunerative crops and when the land is abandoned it will not even produce grazing and takes many years

to recover and on some soils seems not to recover during a lifetime. I have frequently noticed how old native shambras leave the land in much better condition than European cultivation.

Precautions will evidently have to be taken to prevent the impoverishment of the land by these novice attempts at larger scale agriculture.

As the area of good grazing is already insufficient for the stock it may be necessary in certain districts to prohibit the ploughing up of grazing. (This by the way is often a clause in the lease of English farms.) Another thing they must learn is to put all the manure on to the land instead of selling it for 50 cents a cart load to be taken out of the Reserve. This is one way of delaying the deterioration of the land. It is more difficult however to find a suitable and remunerative rotation of crops for this purpose.

In helping these people to new occupations and greater wealth there are three methods open to us.

(1) The *laissez faire* or wait and see method so attractive to some because it is so easy at the present and leaves all the troubles to our successors.

(2) The introduction of some form of individual land tenure because we Europeans have no experience of any other.

(3) Some *via media* which while retaining the community of land will permit the extension of agriculture and the improvement of stock and grazing.

Let us consider each of these in turn:—

(1) If events were allowed to take their own course under the present native laws, viz.:—

(a) Community of land.

(b) Compulsory individual fencing of fields against stock.

(c) The right of any individual to cultivate as much land as he likes and to graze as many head of stock as he likes, provided that he cannot claim the land as his own but as soon as he ceases to cultivate it, it becomes public property.

What would be the probable results?

If the laws were upheld—

(a) It would become too burdensome and costly to fence large areas with temporary fences as I have found myself. In many districts it would be impossible owing to lack of poles and sticks.

Therefore crops would be continually destroyed, quarrels arise, fines be imposed, and so on.

(b) In self defence the man who wanted to cultivate large areas would have to erect permanent wire fences or hedges. In time this would lead to individuals claiming the land they had fenced and finally when they did not require it all or had ruined it to lease it out to others. Thus starting the system of land owners and landless, rich and poor.

Similarly a man might so allow his stock to increase as to usurp more than his fair share of land. He too might improve the grazing or have better stock and fence them in with wire fences and so lay claim to the land. In fact there would be nothing to stop the land falling into the hands of a few.

(2) If the second course were adopted and some form of individual land tenure deliberately introduced—

(1) How could one obtain even an initial equitable distribution of the land? Not only would survey be very costly but the apportionment of agricultural land, grazing, and water would be an impossible feat.

(2) If each selected his own, the greedy or stronger would rob the milder and more unselfish.

(3) Even were an ideal sub-division possible, what would happen in the future? In the case of a man who had many sons the land would be divided up amongst them and be inadequate for each. Whereas the land of a childless man would go to his brother (say) and so swell his holding. So that the land would gradually accumulate in the hands of a few, leaving others with insufficient or none.

(3) In the third course we should attempt *now* to devise a scheme whereby the community of land can be retained so that none may be impoverished or lose their freedom whilst yet protecting the energetic agriculturist or stock owner.

In attempting to cater for the new conditions which will arise we must take into consideration the number of people and of livestock and the total area and quality of land available for them.

At the last estimate there were some 70,000 people of which 17,000 were registered adult males. If we take the number of widows as balancing the number of unmarried men this means 17,000 households for which is available 500,000 acres, i.e. 30 acres each. Some of this is agricultural land, bush with grazing for small stock but



almost useless for cattle. Some is grazing land, hilly and rocky, unfit for agriculture, steep river valleys and forest, largely thorn.

The number of livestock is not known but every dry season there is an outcry of shortage of grazing and often considerable migrations.

Evidently if 30 acres is the average area of all qualities available for the cultivation and grazing of each household a limit must be put to the area which any individual has a right to use. It need not necessarily be the 30 acre average for many will not require the whole of this. But on the other hand if the limit to area per individual household is put much higher there is no allowance for the inevitable increase of population under better hygiene and greater wealth.

I do not know what would be the average number of head of cattle per acre but suppose it is in the neighbourhood of three acres to one beast and that six sheep or goats are equivalent to one cow, then the limit would be 10 head of cattle or 60 head of sheep and goats if a household merely cultivated by hand the usual half acre or acre. Whereas if a man had no stock he could plough 30 acres.

Probably one should allow a larger area for stock than for agriculture, at least double, making 20 acres the maximum for agriculture and 40 for grazing, i.e. say, 14 head of cattle or 80 sheep and goats.

Beyond this number of livestock a man must take the profits, i.e. sell the surplus stock just as a European farmer does. In this way improvement of stock would be helped by keeping the better beasts and overstocking would be prevented. The agriculturist being similarly limited would be encouraged to keep his land in better condition. It is almost impossible even for experienced farmers to keep large areas in good condition for long without manure.

(Should it occur that some ambitious ones wish to exceed these limits I see nothing for it but that they acquire land from Government elsewhere, for it is better that an individual be put to inconvenience than that he rob his neighbours of their undoubted rights or livelihood.)

Having decided upon the most equitable limits one must then consider fencing.

It is on the one hand too onerous, too expensive, for the individual to fence; on the other it is dangerous to allow the erection of permanent private fences. But one must afford the agriculturist and the man who would go in for improved stock protection. Therefore one must have communal fences.

This sounds a very difficult proposition. It is difficult, but not so difficult I fancy as might be thought, for the following reason.

The basis of Kipsigis government before European government displaced it was the social unit called "Kokwet." It comprised the inhabitants of a compact area (there being no villages) of say one or

two square miles according to the density of population and natural features. The members of the Kokwet council, which all adult males could attend as members, tried all cases, adjusted all matters pertaining to the Kokwet. It called in judges from outside when necessary. All administration was free; even the judges received no pay.

These Kokwet have now lost all their functions except mutual help at cultivation, harvest and purely domestic matters for all authority was taken by the Central European Government, for we did not even know that they existed nor could have understood such a form of government. Yet one must admit that it had some efficiency to allow a handful of people to come into hostile country and develop into a considerable tribe at the expense of the Masai, Kisii, and Sirikwek (whoever they may have been).

These social units still exist and it should not be impossible to restore some of their functions and responsibilities.

Without some such arrangement it is difficult to see how agricultural and pastoral progress can take place.

In the particular matter in question (namely fencing) every Kokwet knows the land, its capacity, its suitability for agriculture, cattle, sheep or goats. It knows its water supplies, and so on, as no one else can know these things. It knows all about its individual members and could control them, as it used to do, for it had the power of expelling undesirables, or incompatibles.

If each Kokwet were to decide upon an area for agriculture and another for grazing in conjunction with the neighbouring Kokwotintwek it would be unnecessary to enclose fields, but a line of fence at very much less cost could be run between the agricultural and grazing areas.

Each member of the Kokwet would contribute to the cost of the fence in proportion to the area he cultivated and the number of head of stock he owned. For example thus:—

200 yards.	(Not fenced)	1 mile.
70 acres agriculture, e.g. maize at 5/- = 3,500/- p.a.	640 acres grazing. 200 cattle or 1,200 sheep and goats say produce 2,000/- p.a. Contribution to 1 mile fence:	
5/- per acre, Shs. 350/-	1/- per head of cattle. 1/- per 6 head of sheep and goats.	
	Total: Shs. 200/-	

This would pay for the fence in a year or it could be spread over two years at half the cess.

The ends of the fields could have temporary bush fences till the permanent fence extended to join that of the next Kokwet.

It is difficult, I admit, but what else is better? If Government would restore the authority of the Kokwet and allow it to elect its own Kiptayat or leader and then back up its authority, nay more, urge it to action, I feel sure the results in the long run will be far better than if matters are allowed to drift or if any attempt is made to introduce individual ownership. The very idea of the latter course rouses the people's wrath more than any other suggestion I know of. Left to themselves they will, of course, drift in ignorance of the troubles ahead.

The reviving of the Kokwet system would, I believe, have a very beneficial effect on the general morale of the Kipsigis. How often does one hear Europeans in private and in public deplore the lack of a sense of responsibility amongst natives of Kenya in general. It is too true and doubtless it is partly due to their simple life, for they have little to lose. But do we not ourselves increase this lack of responsibility by taking the management of all their local affairs out of their hands. If each Kokwet managed its own affairs as of old with, of course, the aid of outside judges or appeal to Government where necessary, surely its members would be bound to regain an interest in their local affairs, and act together for the benefit of their social unit and so acquire a sense of responsibility.

#### LAWs.

I suggest that it would be a wise precaution to put in writing the present laws which are deemed suitable and to alter and add to them as seems necessary, recording the whole in the District Commissioner's office, e.g.

1. Community of land as at present.
2. Private fencing of a temporary nature permitted.
3. Permanent fences or hedges only permissible if Kokwet refuses to build a common fence. And that then these fences give no permanent right to the land but only the right to the produce. As soon as the land is no longer beneficently utilised it becomes public property.
4. Kokwet to assign areas for cultivation and grazing and no one to infringe these boundaries.
5. Kokwet must make communal fences where the need arises and it is empowered to levy contribution to the fence from all its members in proportion to their cultivation and stock (in some such way as suggested above).

6. Kokwet to have jurisdiction in all these matters with right of appeal on either side to higher authority.

7. The contributions of each Kokwet should be applied only to the fences of that Kokwet, and not go to a general fund, so that the people may at once see the result of their contribution and not regard it as an increase in taxation.

As the Local Native Council contains men who do not represent the public and some who are the kind of men who would be inclined to benefit themselves at the expense of the people, great care will have to be exercised in ascertaining (1) native laws, (2) altering laws and passing new ones for the protection of the rights of the people.

Finally I would add that in the case of the Kipsigis the teaching of new remunerative occupation is particularly urgent because they are now prohibited from going out to seek work outside their district and there is no work for very many of them in the neighbourhood of the Reserve. They will therefore find it even more difficult than before to pay hut and poll tax.

For many months now scarcely a day passes without many applying for work, mostly very young men from 16 to 20 years old.

If we do not find interesting work for them, they will surely take to illicit occupations again if only to obtain their hut and poll tax and marriage cattle.

#### A NOTE ON MAIZE AS SOLE CROP.

A rough calculation will show the amount of grain each family has to produce at present prices to supply its own needs and pay taxes, if it has no other source of income.

We have estimated the population at 70,000 and taxpayers at 17,000, i.e. four to a family, man, wife, and two others (whether children or widow or aged).

The usual ration on estates is  $1\frac{3}{4}$  to 2 lbs. of posho a day. Thus each such family of four will require at least 5 lbs. of grain per day or 10 bags a year (exclusive of ceremonial beer or beer for payment for work done, also seed and reserve). The tax of Shs. 13/- with maize as at present at Shs. 2/- per bag is equivalent to six bags of maize.

Each such family therefore must produce 16 bags of grain at least. The average European maize crop is perhaps eight bags per acre. The native crop is hardly likely to be more, especially as they will not learn to plant early in the year.

Therefore each family of four must cultivate two acres and not suffer from locusts, drought, hail or cutworm. To do this by hand cultivation is a very considerable task.

Evidently some other sources of income are required.



# A SHORT ACCOUNT OF A STONE AGE CULTURE FROM A ROCKSHELTER OF MOUNT ELGON.

By MAJOR FRANK MOYSEY.

- (1) Introduction.
- (2) The Excavation.
- (3) Description of Cultural Objects.
  1. Implements.
  2. Ornaments.
  3. Iron Objects.
  4. Ceramics.
- (4) Fauna.
- (5) Interpretation of the deposits.
- (6) Discussion.
- (7) Conclusion.

## 1. INTRODUCTION.

It is with some hesitation that an amateur archaeologist enters the field of the pre-historian in East Africa. The expert is naturally rather horrified at the thought of an amateur attempting to explore a pre-historic site because valuable information which might be obtained in the course of excavation may be irretrievably lost by lack of knowledge and failure to take essential notes at the time.

To forestall criticism therefore, a word or two of explanation becomes necessary.

The object of these notes is to have a more permanent record of the excavation and finds which may be of value to students of East African archaeology in connecting up the various industries and cultures which may still lie hidden.

Apart from legend and speculation little is known of the pre-history or archaeology of the Elgon country. The visits of trained field workers are a rare occurrence in the district. I availed myself of the presence of Dr. A. Galloway, of the University of the Witwatersrand, South Africa, who was in East Africa as scientist and advance member to the del Grande Expedition among Pygmy and Gorilla. This paper is in the nature of a preliminary report of the more exhaustive analysis which he is preparing. It is submitted in the hope that it may stimulate local fieldwork in archaeology which is at present overshadowed by the work of the number of cultural anthropologists in East Africa. Throughout the paper I have drawn extensively on the field notes of Dr. Galloway and from his letters and interim reports discussing the various aspects, stone implements, ceramics, etc.

I am much indebted to Dr. Davies, of the Uganda Geological Survey, for his advice and notes on the geology of the area.

By the above acknowledgements I am almost secure from criticism, but as regards the interpretation of the stratigraphy and certain tentative conclusions, for which I am entirely responsible, these are more open to attack.

## 2. EXCAVATION OF ORCHARD CAVE, EQUAT FARM, S.W. ELGON.

Fig. 1 is a sketch of the area surrounding the excavation. The site lies about twelve miles S.W. of Kitale on the foothills of Mount Elgon. Briefly the geology of the area is as follows:

The country marks the edge of the Elgon volcanic series, which lies on a base of ancient (Basement Complex) quartzites intruded by granite. Very little lava occurs in the vicinity and certainly none around the cave, which was hollowed out partially at any rate by differential weathering along bands of agglomerate of differing degrees of grain. At some quiescent period during the volcano's history, fine ashy silts were laid down in pools which lay on the badly drained surface of the agglomeration. These layers seem to be particularly suited to cave formation especially when they are up against softer layers of tuff.

The rock shelter lies in a small valley and has been hollowed out at the base of a cliff. The ground falls steeply to a small stream about twenty-five yards from the cave entrance. The stream has been rejuvenated and has cut back on a base level over 20 feet lower than that previous, to a point just below the shelter. Thus the old 25 foot terrace deposits have had a chance of preservation above that spot.

For purposes of reference each area of the shelter was given a capital letter.

Fig. 2 shows (a) the vertical section of the cave from the cliff to the stream, (b) plan of the cave and platform, showing the areas excavated.

### *Area A.*

The first part excavated was the western side of the cave. The agglomerate floor of the cave sloped from the centre to the walls. This fact was overlooked and horizontal layers instead of wedge shaped were excavated. This did not materially affect the finds or the stratification.

The upper layer of A (A1), 2 ft. in thickness, was composed of animal manure, ash from the numerous fires which had been lit in this

corner and aeolian dust. Numerous bones, some charred, were found. Crescent shaped bone ornaments, pottery and stone implements appeared amongst the many flakes. There was no apparent difference in the stratigraphy so that an arbitrary definition of layers was made on cultural finds, especially ceramics. A1 gradually merged into A2. About the 3 ft. level however the soil type of A2 finalised itself into a dark soil with an ash admixture. Pottery, stone implements and flakes of obsidian and quartz were found. Animal bones and teeth were prolific, especially near the walls of the shelter. Human bones—lower end of femur, head of femur, head of humerus, and 5th metatarsal bone of the foot were found. These isolated fragments appear to have been deliberately fractured and show no evidence of gnawing by rodents. In the material used for implements there was an equal proportion of obsidian and quartz.

### *Area B.*

This area is at the mouth of the shelter at the west end of the fallen rock which here masks the entrance. Hillwash has accumulated against the fallen rock and has penetrated into the cave at this spot. The first  $4\frac{1}{2}$  feet formed a consistent layer of loam which contained several large boulders. Crude pottery showing a variety of design was found, also a number of chips but few finished implements. Everything was of crude craftsmanship.

This loamy soil changed to a fine rubble in a matrix of red earth. This was rich in a quartz microlithic industry of superior execution showing a greater variety of types than were found in B1. No animal teeth were found but the crown of a human 3rd molar. The depth of the rubble layer of B2 was  $1\frac{1}{2}$  to 2 feet; it lay directly on the rock bottom and was implementiferous throughout.

### *Area C.*

In the anticipation that the area between the shelter and the stream might be a midden, an exploratory trench was run through this area. It was 20 yards long.

No midden was discovered, but the stratification is of interest. Starting from the fallen rock at the cave mouth and proceeding down to the stream the layers were as follows:—

#### *First 6 feet.*

(1) 1 ft. 8 in. Black loam containing a few quartz flakes at the base.

(2) 1 ft. 4 in. Coarse rubble. This is unrolled and consists of pieces varying from 1—3 inches in length. The material consists of agglomerate, micre-shist and quartzite in nearly equal proportions.

The layer also contains rounded pebbles some of which are broken and all show signs of use. The rubble contains many quartz chippings and occasional pieces of bone.

The whole of this coarse rubble layer appears to be cave debris.

(3) 1 ft. Fine rubble which lies on the rock. This appears to be the same type as that appearing in B2 but is sterile at this point.

*From the 6 to the 16 ft. mark.*

The rock bottom falls away and the trench is now 6 ft. deep. The three layers continue. Large boulders rest on the rock, the space between them is ravined by the fine rubble which here contains scattered quartz chips.

*From the 16 ft. to the 30 ft. mark.*

The black loam deepens and varies from 3 to 4 feet in depth. The coarse rubble is now mixed with a fined rubble and is rich in quartz flakes. An ash layer appears in the black loam but it produced no artefacts. At this point the layers are as follows:—

1 ft. black loam (sterile).

1ft. ash (sterile).

1 ft. black loam (pottery, quartz, and obsidian chips).

2 ft. mixture of coarse and fine rubble (quartz chips).

1 ft. fine rubble.

*From the 30 ft. mark to the stream (30 ft.).*

At the 30 ft. mark the rubble layers taper to a point and from here onwards the black soil lies on the rock which is found at a depth of 8 to 9 feet.

### 3. DESCRIPTION OF CULTURAL OBJECTS.

#### (1) IMPLEMENTS.

For this description I am taking as my authority Dr. Leakey's book "The Stone Age Cultures of Kenya Colony."

The industry from all parts appears similar, the only difference being in the proportion of obsidian to other materials (quartz, quartzite, and chert). Obsidian is most frequent in the upper layers and becomes more progressively scarce the lower the strata. At the base of the deposit it was altogether absent.

The principal types found are backed blades and scrapers. The blades include gravette points, typical lunates, and trapezoids. In addition to these there are a large number of unconventionalised





FIG. 1.

Rough Sketch of country surrounding Orchard Cave  
Approximate scale 2 inches : 1 mile

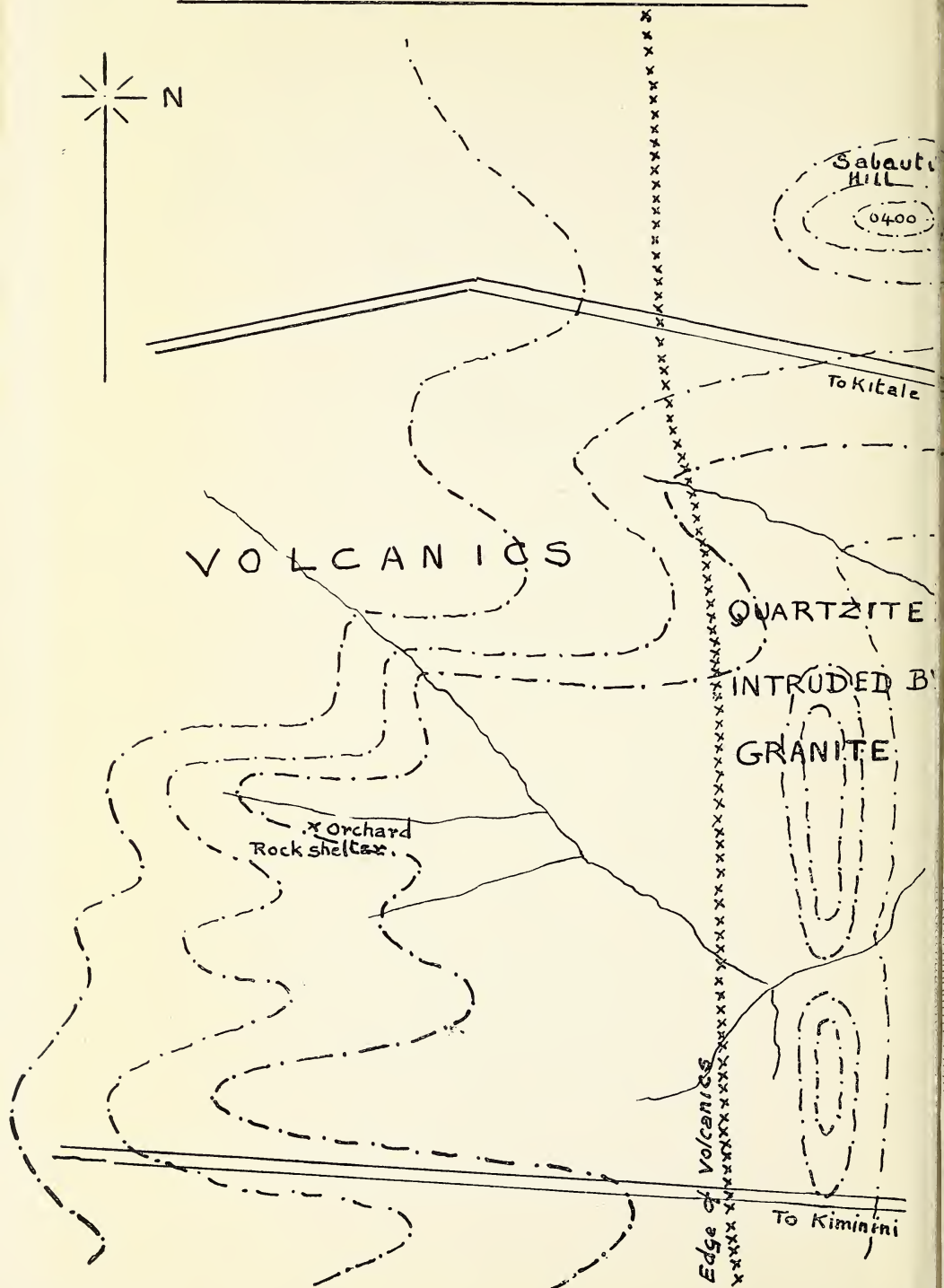


FIG. 2 (a).

Vertical Section of Orchard Cave from Cliff to Stream on a line through Trench "C" and Area "A".

Approximate Scale. 1 inch : 18 feet

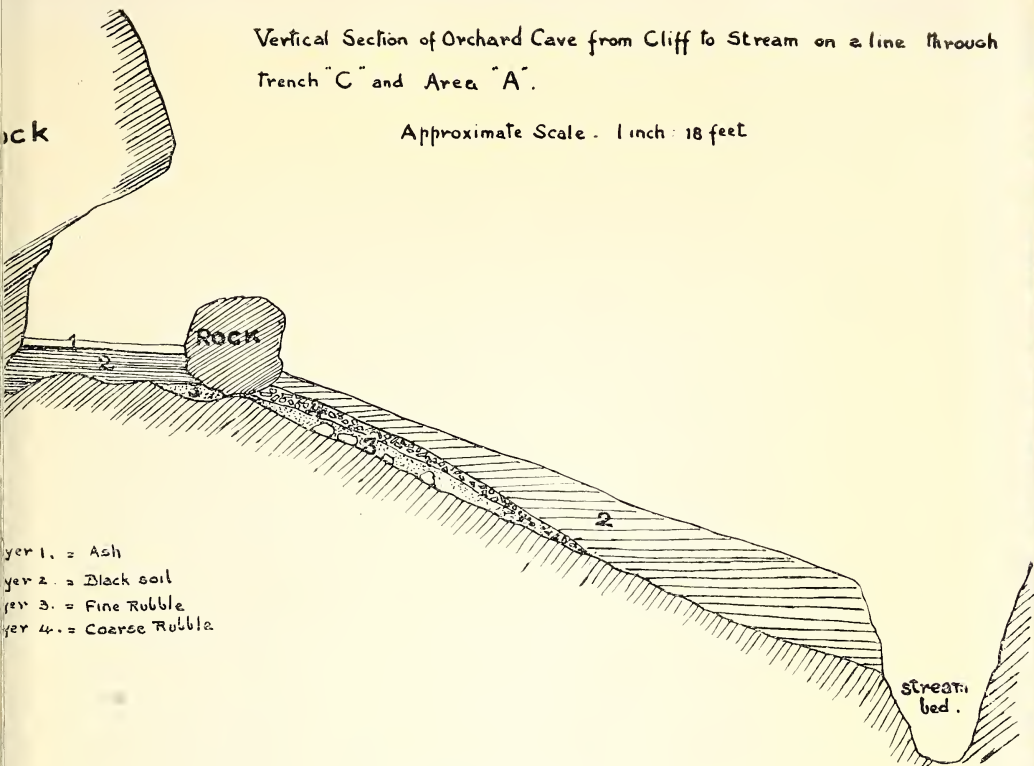
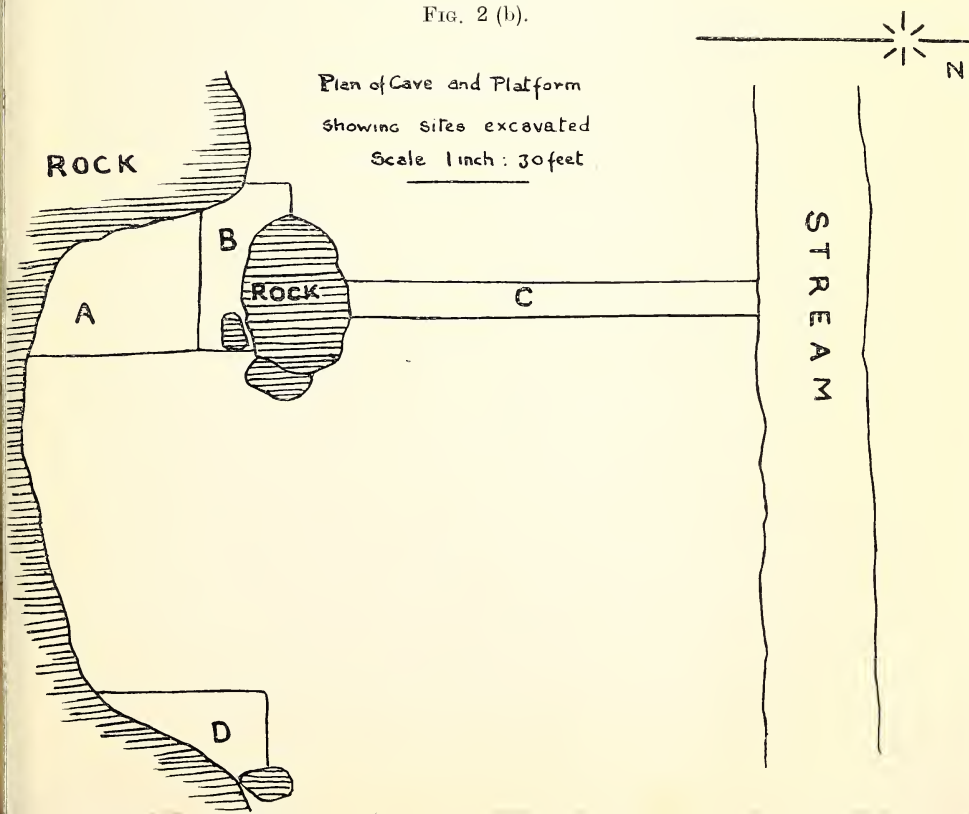


FIG. 2 (b).

Plan of Cave and Platform  
showing sites excavated  
Scale 1 inch : 30 feet







points and blades and a couple of small borers or "pseudo Tardenoisian burins." No typical or large blades were found. The only non-microlithic implements found are rough flakes, cores and fabricators.

An outstanding feature of the industry is the consistently small size of the conventionalised implements. The average size of the backed blades is that of the smallest specimens figured by Dr. Leakey and the scrapers are smaller than any illustrated by him. It is an ultra-microlithic culture. Technically some of the blades and scrapers resemble closely those of Gumban B; others approach the Kenya Wilton types. On the character of the implements alone one would be inclined to refer this material to the dwarfed forms of the Kenya Wilton.

Large perforated spheroidal stones were found. Dr. Leakey does not mention this type of artefact in connection with cultures he describes. The stones are identical with those which abound in the late stone age horizon of South Africa and which are conventionally regarded as weights for digging sticks. An implement that may have been used for boring these stones was also found. It is of hard lava, cylindrical in shape, 4 inches in length, and 1 inch in diameter. One end has been brought to a point, which is worn down by use.

A curved knife,  $6\frac{1}{2}$  inches long, made of lava, was found in the same area. Triangular in section the blade is 1 inch in depth and is pointed at one end. The cutting edge has been chipped throughout the length of the blade but with the material used it could never have been very sharp and I cannot think for what purpose it was used.

Round pebbles which generally show signs of use as hammers or as grinding stones were found in large numbers. Sixty of these were taken from the rubble layer in a small area outside the cave. These vary in size and material from small ones of quartz of 1 inch diameter to large balls of lava  $4\frac{1}{2}$  inches across. The association of these stones with a late stone age industry is not recorded by Dr. Leakey.

In his book "The Stone Age Culture of Kenya," Dr. Leakey writes as follows: "The earliest deposits in which the Kenya Wilton is known to occur are the silts and muds which belong to the very close of the Makalian wet phase. Branches of this culture probably persisted until much later times, and it seems likely that the Gumban cultures are the result of a development of a Kenya Wilton under outside influence."

## (2) ORNAMENTS.

Cowrie shells and a perforated boar's tusk were found in area A1. A few blue import beads appeared in the surface ash of area D.

### (3) IRON OBJECTS.

Iron rings were found in A2 and in the trench C at a depth of about 8 ft. near the stream.

A piece of iron shaped like a spearhead but blunt and thick was found at a depth of 2 ft. near area D. It was probably used for digging.

### (4) CERAMICS.

A preliminary survey of this material has been given by Mr. G. H. Wells, a co-worker of Dr. Galloway's, in a paper on "South African Native Ceramics" read before the Portuguese Colonial Anthropological Congress, 1934. He states that in Dr. Galloway's collection of ceramics from the excavation "At least three groups of pottery are represented. The oldest is a coarse ware, often heavily decorated with incised and impressed patterns. These are closely similar to those of Leakey's Gumban pottery, but the peculiar internal incisions are not present. With these sherds are associated externally applied lugs quite similar to those seen in Hottentot pottery, and also well-shaped semicircular handles. The form is simple and has a slightly inverted lip.

"A second and later class of Elgon pottery consists of thin shapely wares, black or brown, and often with a rich burnish. The moulded base is a common feature of this group. The ornament incised or impressed, is disposed in narrow zones surrounding the rim, belly, and base of the vessel. Drilled repair holes are sometimes present. The general aspect of this pottery strongly suggests a foreign prototype.

"The most recent class consists of large, globular, vertical-necked jars in a coarse grey ware, often lavishly decorated with impressed patterns. This is closely similar to that of modern East African tribes such as the Masai."

This classification may be correlated with the stratigraphy of the cave. The first group as classified by Wells is largely confined to C2, extending to some extent into C1 and B2. His second group is found almost entirely in A1 and A2, while the third occurs in stratum 1 in all areas, but is not found at depth.

In addition to the comparisons with Gumban and Hottentot types, Wells points out resemblances between the first group of Elgon pottery and Neolithic material from the southern Sahara and the French Sudan. These comparisons unite in suggesting a recent prehistoric date for this material.

#### 4. FAUNA.

The types identified in comparison with Hopwood's notes on the Makalian fauna are as follows:—

Baboon. In A2 only.

Warthog. Throughout all the deposits.

Bushpig. In A2 only.

Viverrid carnivore not accurately identified. In A2.

Several small antelopes not identified. In A1, A2, B2, C1.

Bovine (*Bos* sp.). In all layers.

Numerous teeth found throughout the deposit clearly belong to an ox type, not a buffalo. It cannot be determined if this type were domesticated or not. Hopwood (p. 272-3 in Leakey's *Stone Age Cultures of Kenya*) identifies a small bovine, the female of which appears to have been hornless, in the Makalian fauna. He points out that no recent African wild cattle with such features are known. The possibility of domestication is not referred to. In the Makalian period (before 2500 B.C. Brooks, p. 270 of Leakey) it is doubtful whether a domesticated form should be expected. If the cave deposits are Nakuran, however, there is more likelihood of domestic cattle being found.

#### 5. INTERPRETATION OF THE DEPOSITS.

I had hoped that a rough date could be given to the deposits of artefacts, etc., from the position in which they lay in the loam and rubble layers of the cave and trench. Dr. Davies, of the Uganda Geological Survey, assures me, however, that nothing conclusive can be proved from the lie of the deposits either inside or outside the cave, unless the aeolian nature of the lowest layer can be substantiated. This is too difficult a problem for me to attempt so that the interpretation depends only on probabilities.

It seems likely that the red rubble deposit was laid down during a dry period and that the black loam which lies above it is the result of hillwash formed during a wet period. If we can accept this assumption, which yet remains to be proved, the problem as to the period in which the cave was occupied is practically solved.

The black loam shows no difference in texture or signs of stratification until it reaches the rubble layer. If it has been laid down during a wet period, then that period has continued up to the present time without intervening dry periods of any extent.

The presence of similar industries in the loam and rubble layers, with only a difference in material and with no intervening sterile layer, leads me to believe that the site was continuously occupied by a people who arrived during a period of dessication and continued to inhabit the cave until well into the last wet phase.

## 6. DISCUSSION.

The stratigraphy suggests a dry period followed by a wet period which has been continuous up to historic times. The wet period is therefore the Nakuran and the dry period, the post Makalian.

An analysis of the cultural finds shows evidence for such an interpretation. The stone implements are ultra-microlithic in character and must be descended from the Kenya Wilton type, not related to but developing parallel with the Gumban. In date it is post Kenya Wilton and in its later phases may be contemporaneous with Gumban. The origins of this culture may be assigned to the post Makalian, since Leakey places the Kenya Wilton in the closing stages of the Makalian.

The evidence of the iron objects can only be taken as corroborative since there is the probability of their being intrusive. If they are not intrusive and if the bovine teeth are those of domestic cattle then the period of occupation extends down to a time much later than Gumban B, partly if not entirely bridging the gap between Gumban B and historic times in East Africa. The preliminary study of the Ceramics hints at this possibility.

## 7. CONCLUSIONS.

- (1) A cave on Mount Elgon was excavated with a view to finding out something of the prehistory of the Elgon region.
- (2) The stratigraphy showed a red rubble deposit overlying the volcanic rock superimposed upon which was a layer of black loam. The former must have been laid down during a dry period and the latter during a wet one.
- (3) The stone implements are ultra microlithic and are descended from the Kenya Wilton type. They are therefore post Kenya Wilton in date. They are not related to the Gumban industry but developed parallel with it.
- (4) The ceramics are classified in three groups; A a group allied to the Gumban A pottery and showing Hottentot affinities; B a group of sherds of high craftsmanship suggestive of foreign influence; C sherds similar to modern native types.
- (5) From the stone implements, the earliest date at which the makers could have occupied this cave is the post Makalian dry period. The continuity of culture from lowest to most superficial layers implies that the cave was in occupation down almost to historic times.



## REVIEW.

THE MESOZOIC PALAEOLOGY OF BRITISH SOMALILAND. (London, 1935. The Crown Agents for the Colonies. £1 10s.)

This volume, consisting of 220 pages of well illustrated text and 25 plates, is Part II of the "Geology and Palaeontology of British Somaliland." The first part, entitled "Geology of British Somaliland," dealt with stratigraphy and was published in 1933. The book now published sets forth the results of the study by specialists in the various orders of the fossil fauna collected by the Somaliland Petroleum Company's expedition under Dr. W. A. Macfadyen as well as the re-examination of earlier collections and revision of the results of previous workers. It therefore presents the most up-to-date information regarding the palaeontology of the Cretaceous and Jurassic strata British Somaliland.

A number of collections from the Jurassic outcrop at Bihendula some 20 miles south of Berbera have been made since Burton's visit in 1855, but the evidence has been greatly amplified by the detailed investigation by the Somaliland Petroleum Company of a section, 912 metres in thickness, comprising 26 beds, at Daghani, a few miles east of Bihendula. The evidence now appears sufficient to show that the range of the series is from Callovian to Portlandian and possibly to Tithonian; some two-thirds is definitely Kimmeridgian. The lowest beds (Bihen limestone) are lacking in ammonites but from the extensive fauna of Brachiopoda, Gastropoda, and Lamellibranchia it has been possible definitely to allocate these to the Callovian instead of a Bajocian-Bathonian age which was favoured by Gregory and Weir.

The greater affinities of the marine fauna of the Upper and Middle Jurassic of Somaliland and adjacent territories with that of North Africa and Europe than with that of Eastern Equatorial Africa, Madagascar and India has appeared to indicate a lack of direct sea communication with the latter territories in those times. The volume under review does not throw much additional light on this subject, partly because of the poor state of preservation of the free-swimming cephalopod fauna which has rendered specific determination difficult in many cases. The local character of the Jurassic coelenterite fauna of Somaliland is again emphasised and Dr. Dighton Thomas finds its closest analogy in the European Upper Jurassic and more particularly in the European Argovian.

The chapter on Jurassic brachiopoda is of much interest. Fifty-three species and varieties, including eight new genera, twenty-two new species and three new varieties are fully described. The extremely local character of the brachiopod fauna is apparent, for although there

are affinities with adjacent territories, including Jubaland, only five species are referable to mid-European forms, and no Indian, Madagascan, or Equatorial East African forms are represented.

In the chapter on Jurassic Gastropoda and Lammellibranchia 47 species and varieties are described. Similarity of the Callovian Mollusca of Somaliland with those of North-West Africa is again noted, and in the case of the Argovian-Kimmeridgian some evidence of affinity with Indian forms also is apparent. The more characteristic species of Somilaland have not so far been found in the Kenya Jurassic.

Little new light is thrown on the stages of the Cretaceous occurring in British Somaliland. Almost the only additional evidence is that provided from 36 specimens of Echinoidea from four localities, which Prof. Hawkins regards as constituting one horizon ascribed to the Upper Senonian.

The Foraminifera are dealt with by Dr. Macfadyen, the Corals and Hydrozoa by Dr. Dighton Thomas, the Jurassic Echinoidea by Dr. Currie, the Cretaceous Echinoidea by Dr. Hawkins, the Crinoidea by Dr. Bather, the Brachiopoda by Miss Muir-Wood, the Gastropoda and Lamellibranchia by Mr. Cox, and the Cephalopoda by Dr. Spath.

H. L. SIKES.

# EAST AFRICA AND UGANDA NATURAL HISTORY SOCIETY.

## TWENTY-FIFTH ANNUAL REPORT, 1935.

We propose to divide this Report into two main sections, firstly, that dealing with the activities of the Society in relationship to its members, and secondly, those relative to the conduct of the Public Museum within the Coryndon Memorial building.

The need for this distinction is even more desirable than hitherto, in view of the confusion which has come to light during the latter part of the year under review.

### MEMBERSHIP.

Twenty-six new members, and two Honorary Life Members were elected, as a set-off against twenty members erased from the Register under Rule 8c of the Constitution, and two resignations.

We are glad to record the fact that overseas members have increased, and several Indian citizens have availed themselves of the "open" membership of the Society.

### JOURNALS.

Two double numbers, equivalent to four Journals, were issued during the year. The subject matter was of the same high standard as in previous years, and many of the contributions have been of wide interest, resulting in increased demand for the Journals from overseas Museums and Institutions. The Society has maintained its reputation as a scientific body, and increased recognition is accorded it throughout the world.

### LECTURES.

Your Committee has kept before it the necessity of stimulating interest in Natural History amongst the youth of the Colony, and to this end, lectures have been given at some of the schools and private demonstrations and tuition have been gladly given when requested. Dr. Leahey gave four private demonstrations on the archaeological collections, and has greatly stimulated interest in this branch of science.

### STUDY COLLECTIONS.

The Study collections, which are available to any member, or bona fide student, on application to the Curator, have shown steady increase. The accessions in the Entomological section are particularly gratifying, due largely to the energetic work of Mr. Allen Turner and Mr. MacArthur. Mr. Gedye also donated the bulk of his beetle collection to the Society. The ornithological material has also increased; particular mention should be made of a valuable though small collection

from Mr. R. E. Moreau of Amani, and collections donated by the members of the Cambridge Archaeological Expedition; the latter also made valuable collections of eggs, accompanied in almost every case by parents. Mr. Hugh Copley presented several valuable fish, and has been instrumental in starting a special fund for the further development of the fish exhibits. The monthly lists of donations have been posted on the notice board in the Museum. Summarised they give the following:

Birds, 235; eggs, 247; mammals and skulls, 297; reptiles and fishes, 18; insects, 10,000 approx.; geological, 125; archaeological, 151; ethnological, 10; botanical, 500 approx.

The Kenya Forestry Department has donated valuable duplicate material, and the Agricultural Department of Uganda presented a collection of pasture grasses; Mr. Arthur Champion donated a comprehensive series of rocks from the Turkana area. To all those who have donated material, we tender our thanks.

We record our thanks to M. Fleutiaux of the Paris Museum for making an exhaustive study of our material of Elaterids and allied groups, resulting in over fifty species being described as new to science. We also record our thanks to Professor Hale Carpenter of Oxford University, Sir Guy Marshall of the Imperial Institute of Entomology, members of the staff of the Insect Room, British Museum of Natural History, Sir Arthur Hill of the Royal Botanical Gardens, Kew, for valuable assistance in determining material and assisting in many other ways.

The Society has continued to be a valuable "feeder" to the Herbarium at Kew, and also to the British Museum, more particularly in the branches of entomology, and it is of interest to note here that this Society submits more material to the Imperial Institute of Entomology than any similar institution, and the National Collections have benefited accordingly.

Miss Fountaine has placed at our disposal her valuable data relative to the early stages of Lepidoptera bred by her.

As a result of grants made by the Empire Grants Committee, acting on behalf of the Carnegie Corporation of New York, several additional storage cabinets were added to the mammal, bird, botanical, and entomological sections. This has resulted in greater facilities in arranging material in systematic order and thus added greatly to the study value of our collections. It is estimated that an additional twenty-five cabinets are required for the insect collection alone, at a cost of £1,600. These study collections are made use of by students and visitors, and members of the Society.

Laboratory accommodation has been provided for overseas visitors. Mr. Gedye continued control of the Coleoptera and allied



groups, in an honorary capacity, and has been greatly assisted in this work by Mr. Allan Turner. Other voluntary workers in the entomological section have been Mr. David Buxton (Orthoptera), Mr. G. van Someren (Odonata), while Mr. T. H. E. Jackson, besides donating valuable species of lepidoptera, has collaborated in field work in this group.

#### LIBRARY.

The Library has expanded during the year, and accommodation is being rapidly overstrained. Additional shelving, costing £60, is urgently required. Exchanges with overseas institutions is increasing, and the value of the Library greatly enhanced. It is to be regretted, however, that for financial reasons, the systematic card-indexing of subjects had to be abandoned as from September, 1934, thus reducing the utility of the library for reference purposes. The utility of a library is in direct relationship to facilities for ready reference provided therein, by means of an up-to-date subject card-index. Even a temporary cessation in this work means years of redoubled work to overtake the hiatus. A part-time Librarian has continued the general card-index and thus maintained contact with overseas institutions. The subject of a Central Students' Reference Library was brought to the notice of Sir Malcolm Hailey, African Research Commissioner.

#### BOTANICAL SECTION.

Owing to lack of funds, this most important branch of the Society's activities was practically suspended as from April 30th. The Herbarium has been made use of by members of several Government Departments, and to a considerable degree by visitors, and many members. The cessation of this activity is reflected in the amount of specimens sent to Kew; thus that Institution loses a valuable "feeder."

We will now deal with the public side of our activities—the Coryndon Memorial Museum.

#### RETROSPECT.

The position during the latter part of the year makes it necessary that we briefly recount the events which led up to the assumption of control of the Coryndon Memorial, as a Museum, by the Society. On February 11th, 1925, Sir Robert Coryndon died. At a meeting of representative citizens, it was decided to ask the public to subscribe for a suitable memorial. The appeal was sponsored by Government over the signature of Sir Edward Denham, Acting Governor. (Appeal, Government House, March 20th, 1925.) The appeal was for funds to erect a hall to be known as the Coryndon Hall, attached to the Society's private Museum on Kirk Road. The control of this addition to be vested in the trustees of the Society, on behalf of the public.

A further appeal was issued by Sir Edward Grigg on February 11th, 1926 (*East African Standard*, same date). In this appeal, it was stated that under the town-planning scheme of Sir Herbert Baker, the site occupied by the Society might be required by the Government, and another site for the Memorial would have to be found.

The idea then was to erect a large central hall which would be the nucleus of a future East African Museum and Research Centre.

The Ainsworth Hill site of 15 acres was selected. The Society was warned that the plot on Kirk Road was required, and Government proposed compensation under certain terms. The sum of £2,500 was agreed upon by the Governor in Council, *provided such money was disbursed by the Society "in furthering the Coryndon Memorial."* No laboratory accommodation had been provided for in the Memorial plans, and your committee offered the sum of £2,000 to the Coryndon Memorial Executive, provided laboratory accommodation to the plans submitted by the Society were adopted.

We were thus obliged to surrender our plot and building and sink our compensation money in a building which we would not own, and controlled by a board of trustees on which the Society was not represented.

Representations were made to Government and the Trustees for safeguards and adequate funds for the conduct of a public museum in the Memorial building by means of specific clauses in the deed of lease and the provision of a clause safeguarding our interests in the event of ejection or assumption of control by Government or the Municipality. These proposals were not accepted. We were assured, however, of adequate support and just treatment. It is of interest to note here the cash value of contributions which Government made toward establishing the Memorial:—

	£
Grant toward cost of erecting the building ...	3,000
Value of land assigned to the trustees ...	4,500
Capital grant for initial furnishings ...	1,000
Compensation money ... ..	2,500
	<hr/>
	11,000
	<hr/>
To this add subscriptions from the public ...	6,000
	<hr/>
	£17,000

The percentage amount spent in annual upkeep and development is totally inadequate and out of proportion to the capital invested.

Between 1924 and 1929, the Government grant to the Society for furnishing its private museum on Kirk Road was £300, and we em-

ployed *no salaried staff*. The comparative table indicates to what extent support has been given and *maintained*.

		1930	1931	1932	1933	1934	1935	1936
Government grant	...	700	700	700	600	600	300	300
Capital grant	...	1000	—	—	—	—	—	—
Municipal grant	...	500	400	200	400	400	300	300
In addition we had E.				The continuance of this was contingent on maintainance of Govt. and Municipal grants at £700 and £500.				
Carr special grant	...	100	100					
Carr subsidy for								
Botanical Section	...	350	350	350	—	—	—	—
		£2600	1550	1250	1000	1000	600	600

It will be observed that the Government grant has been reduced from £700 in 1930 to £300 in 1935-36, while the Municipal grant has fluctuated from a maximum of £500 to £200 to £300 in 1930-36.

It must be realised that the Society conducts a museum in the Memorial on behalf of the Trustees, to enable *them* to fulfil their undertakings to Government, which obligations they have passed on to the Society. It is felt that the Society is handicapped by the constitution of the Board of Trustees, resulting in discontinuity of policy, lack of understanding and interest in the welfare of the Museum, and absence of strong backing in our endeavours to fulfil obligations.

Of necessity, the taking over of the Coryndon Memorial, as a Museum, in 1930 meant the employment of a salaried staff. To this end, estimates of expenditure on this account were submitted to Government, resulting in the grant of £700 for this purpose. At the same time Government was made aware that the cost of the Botanical Section, for a period of three years only, would be met from funds kindly made by Mr. E. Carr. At the end of 1930 application was made for the inclusion of a grant in the estimates for 1931. A special sub-committee of Executive Council was appointed to scrutinise our budget. The report of this committee contains the following: "The committee examined the expenditure for 1930 and came to the conclusion that the expenditure was reasonable." "The withdrawal of the grant-in-aid for 1931 would, in view of that possibility, have a very serious effect on the activities of the Society and on the development or even continuance of the *Museum*." "The estimates (for 1931) showing expenditure on staff amounting to £800 (over and above the Carr special grant) was examined . . . and was considered reasonable." "The Committee is of the opinion that the payment of a grant of £700 from Government funds is fully justified. . . ." "As

to the value and importance of the work of the Society, and the Museum, there can be no doubt. The Committee therefore recommends that provision be made in 1931 for the payment of £700. (Sgd.) Director of Education, Treasurer, and H. E. Schwartze. These findings were endorsed by Legislative Council.

In 1930 the following staff was employed :

Curator, two personal assistants paid by Curator: a Botanist and a Librarian.

1931-32—Curator, one personal assistant paid by Curator: Botanist and Librarian.

1933-34—Curator, Librarian, and Botanist at 33% cut in salaries.

1935—Curator, part-time Librarian, Botanist for three months only, all at reduced salaries.

1936—Curator, part-time Librarian, at reduced salaries.

It is needless to say that the existing staff is totally inadequate, and furthermore, it is not to be expected that staff can be maintained unless there is some security of tenure of employment.

In this connection it is of interest to note the considered opinion of the special Museums Commission representing the Carnegie Corporation, Sir Henry Miers and Mr. Markham, M.P., in their report, 1932, which reads as follows: "The time is almost ripe for the appointment of a full-time Director and Keepers of Departments." "Kenya and Zanzibar each have an excellent public Museum in which much valuable research and educational work is being done." This report was followed by a grant of £1,000 for equipment and furnishings, in 1934, and an invitation to apply for further funds in 1936. It is important to note that Carnegie grants are conditional that subscribing authorities would not reduce their annual support as a result of these special grants.

Members doubtless saw the unfortunate reference to the Society as published in the Majority Report of the Finance Committee, and the subsequent debate in Legislative Council on January 7th as reported in the *East African Standard*. Your committee feels that such reflections on the conduct of the Society's activities are entirely without foundation and can be due solely to lack of knowledge of the position on the part of Government. Such statements are calculated to be detrimental to our good relations with other contributing bodies and the Carnegie Corporation, overseas institutions, as well as members of the Society outside Nairobi.

Your committee relies on the full support of members of this Society in any steps which they may decide on, in combating these published statements, based on misunderstandings. Your committee



feels that this lack of understanding may be due to changes in the personnel of Government since 1929.

In the report of the meeting between representatives of the Society and Government, regarding the grant for 1936, reference was made to the amount of loan material on exhibition. From remarks made, it would appear that Government does not realise that we took over a large empty building, and loan material was necessary to make a display; further, that in order to replace this material—and the Society is only too anxious to do so—funds must be forthcoming to employ collectors, meet travelling expenses, and cost of preparing the material. Such funds can only be obtained from Government and/or the Municipality. Such remarks are a direct argument in favour of adequate funds being given, and cannot be used against the Society as reflecting on their activities in the Museum. To replace the loan material with new specimens, or to purchase it, would cost over £5,000.

The fauna and flora of this country has been exploited mostly by expeditions from overseas, most of them foreign, and nothing has been done to assist local institutions; collections that exist have been made and paid for by private individuals. There is the additional danger that this material may be withdrawn.

With every year that is allowed to elapse, so will the cost of replacement increase.

#### MUSEUM PROGRESS.

The development of the Museum throughout the year has been curtailed in certain directions, for example, the Botanical section; nevertheless, considerable additions have been made to exhibited material. As a result of the Carnegie Grant, seven additional standard metal show cases were installed and collections arranged therein. Several new mammals were added, including a splendid leopard presented by the American Museum of New York; a bushbuck habitat group was completed and over fifty new birds installed. Two new mammal cases and one bird case were erected and exhibits arranged therein and relabelled. One special exhibit of barbets and woodpeckers was staged and a further exhibit put in hand. Additions were made to the fish exhibits. The Ethnological exhibits have been re-arranged and in this work Dr. Pinto Lima gave assistance. The entire Anthropological and Archaeological material was re-arranged by Dr. Leahey and much new material added. This section is one of the most comprehensive and complete to be found in any museum throughout the world.

Mr. Allan Turner again rendered valuable voluntary assistance in preparing material for exhibition, more particularly in the bird section.

Systematic work in the study rooms, on which material for exhibition depends, has progressed in several directions. A start has been made in certain economic exhibits including one dealing with coffee pests. In this work Mr. J. MacDonald has given great assistance.

#### VISITORS.

The number of visitors to the Museum has been gratifying. Several parties of native students, amongst them members of Makerere and King's School, Budo, have visited the institution. Six hundred school children, European, Asiatic, and African, in twenty parties, have been conducted round the exhibits, and parties of native chiefs and retainers have been admitted free. All children under the age of 15 are admitted free. Adult visitors numbered 2,200.

#### FINANCE: GENERAL.

We desire to place on record our thanks to the Empire Grants Committee and the Carnegie Corporation of New York for their generous grant of £1,000 for furnishings and exhibition cases; to Government and Municipality for grants in aid; to Government and the General Manager, Uganda Railway, for sympathetic consideration in connection with customs dues and railage on exhibition cases purchased with the Carnegie grant.

The accounts of the Society have been under the charge of Mr. Humphrey Slade, as Honorary Accountant, and to him we tender our thanks and appreciation for these services. We also wish to thank Mr. Murrell for again auditing the accounts.

A balance sheet is appended hereto. As heretofore, your committee has devoted the bulk of the monies derived from members' subscriptions towards the cost of publishing the Journal.

The Journal is the most expensive outlay of *Society's funds*, but it is, however, the sole return many members obtain for their subscription, and on this account is justified; furthermore, it is the link between this Society and overseas institutions, and is the means of obtaining valuable literature and publications, by exchange, which we could not otherwise obtain. Your committee finds it increasingly difficult to maintain the Journal on this slender income, and steps will have to be taken to increase the vote. Suggestions on this point will be welcome. We would again remind members that subscriptions are due in January, and the early receipt of this money greatly facilitates framing the budget.

Your committee has carefully scrutinised every item of expenditure, and quarterly revisions have been made as required. As hitherto, the salaries of staff have been met from Government and Municipal grants.

# EAST AFRICA AND UGANDA NATURAL HISTORY SOCIETY.

## Receipt and Expenditure Accounts, January to December 31st, 1935. GENERAL REVENUE.

EXPENDITURE.		RECEIPTS.	
Curator's Salary ...	...	Government Grant ...	...
Librarian's Salary (part time) ...	...	Municipal Grant ...	...
Wages, menial staff ...	...	Subscriptions ...	...
Journals, cost of printing ...	...	Visitors ...	...
Postages ...	...	Sales of Journals ...	251 50
Stationery ...	...	Less discount ...	28 00
Post Offices charges ...	...		
Insurance ...	...		
Bank Charges ...	...		
Lighting and Heat ...	...		
Water Rate ...	...		
Transport ...	...		
Lectures, Meetings ...	...		
Miscellaneous upkeep ...	...		
Balance transferred to General Capital A/c.	759 14		
	<hr/>		<hr/>
	Shs. 20,428 95		Shs. 20,428 95

# BOTANICAL REVENUE.

EXPENDITURE.		RECEIPTS.	
Botanist's Salary (three months and leave pay ... ..)	2,333 33	Balance transferred to General Capital A/c.	2,413 57
Botanical Journal and expenses ... ..	51 15		
Petty Cash ... ..	29 09		
	<u>Shs. 2,413 57</u>		<u>Shs. 2,413 57</u>
CAPITAL A/C.			
EXPENDITURE.		RECEIPTS.	
Periodicals ... ..	379 00	Hire out of Cinema ... ..	100 00
Balance transferred to General Capital A/c.	391 10	Contributions to Bongo ... ..	94 60
	<u>Shs. 770 10</u>	Sale of Journals, back numbers ... ..	575 50
			<u>Shs. 770 10</u>
ASSETS A/C.			
WRITTEN OFF.		ACQUIRED.	
Bad Debts ... ..	1,159 77	8 Metal Show Cases ... ..	9,860 00
Depreciation ... ..	12,806 36	4 Entomological Cabinets ... ..	6,575 00
Sale of Journals, back numbers ... ..	575 50	1 Bird Cabinet ... ..	495 00
Bal. transferred to General Revenue A/c.	6,477 37	Periodicals, cost ... ..	379 00
		Periodicals by exchange ... ..	2,000 00
		Journals on hand, current ... ..	1,710 00
	<u>Shs. 21,019 00</u>		<u>Shs. 21,019 00</u>



[illegible]

Dr.		Cr.
To Appropriation to Capital Account half cost Entomological Cabinets ...	875 00	10,000 00
" 4 Entomological Cabinets ...	6,575 00	9,860 00
" Bird Cabinet ...	495 00	... 02
" Habitat room ...	451 00	151 64
" Stands ...	649 00	...
" Transferred to Assets Account, 1935	9,860 00	...
" Miscellaneous construction expenses	139 20	...
" Miscellaneous; transport, handling ...	967 46	...
	<hr/>	<hr/>
	Shs. 20,011 66	Shs. 20,011 66

## LIABILITIES.

Subscriptions paid in advance	...	140 00
Sundry creditors	...	1,668 50
Jackson Memorial Fund	...	11 50
<b>CAPITAL ACCOUNT.</b>		

Credit Balance brought forward.

January 1st, 1935	59,868	14
..	..	..

## Appropriation from Carnegie

Grant	...	...	...
-------	-----	-----	-----

Credit Balance. General

Revenue Account

Credit Balance. Capital

Account

Credit Balance, Assets A/c.

Less

Debit Balance, Botanical

Revenue Account, 1935

65,957 18

Debit Balance Carnegie

Grant Account ...

65,805 54

Shs. 67,625 54

Shs. 67,625 54

Value of collections not shown. insured. insured.

value as at December 31st. 1935 £15,000 0 0

(Sgd.) H. SLADE, Hon. Accountant.

V. G. L. VAN SOMEREN, Aq. Hon. Treasurer.

I have audited the Books and Accounts of the East Africa and Uganda Natural History Society and certify that the Balance Sheet is in accordance therewith.

Nairobi, February 3rd, 1936.

(Sgd.) J. W. H. MURRELL.

# EAST AFRICA AND UGANDA NATURAL HISTORY SOCIETY.

## PUBLICATIONS OF THE SOCIETY :

THE FOLLOWING BACK-NUMBERS OF THE JOURNAL ARE AVAILABLE :

Journal No. 3	...	...	Shgs. 20/-	Journal No. 25	...	...	Shgs. 5/-
" " 4	...	...	" 20/-	" " 26	...	...	" 6/-
" " 5	...	...	" 20/-	" " 27	...	...	" 6/-
" " 6	...	...	" 20/-	" " 28	...	...	" 5/-
" " 8	...	...	" 10/-	" " 29	...	...	" 5/-
" " 9	...	...	" 20/-	" " 30	...	...	" 10/-
" " 10	...	...	" 20/-	" " 31/32	...	...	" 7/50
" " 13	...	...	" 20/-	" " 33/34	...	...	" 7/50
" " 14	...	...	" 20/-	" " 35	...	...	" 7/50
" " 15	...	...	" 10/-	" " 36	...	...	" 7/50
" " 17	...	...	" 5/-	" " 37	...	...	" 7/50
" " 18	...	...	" 5/-	" " 38/39	...	...	" 7/50
" " 19	...	...	" 4/-	" " 40/41	...	...	" 7/50
" " 20	...	...	" 2/-	" " 42/43	...	...	" 7/50
" " 21	...	...	" 4/-	" " 44	...	...	" 7/50
" " 22	...	...	" 5/-	" " 45/46	...	...	" 7/50
" " 23	...	...	" 5/-	" " 47/48	...	...	" 7/50
" " 24	...	...	" 5/-				

MEMBERS OF THE SOCIETY ARE ENTITLED TO 20% DISCOUNT.

Members having any of the missing numbers in the above list and wishing to sell, are requested to communicate with the Editors.

THE FOLLOWING SEPARATA ARE ALSO AVAILABLE :

The Birds of Kenya & Uganda, Parts 1—9, Vol. I (van Someren) Shgs. 5/- each.  
Parts 1—3, Vol. II (van Someren) Shgs. 5/- each.

NOTE :—The above are paged in sequence and suitable for binding in volumes.  
(Fully illustrated.)

The Butterflies of Kenya and Uganda, Parts 1—10 (van Someren) Shgs. 5/- each.  
Part 1, Vol. II.

NOTE :—The above are paged in sequence and suitable for binding in volumes

THE FOLLOWING REPRINTS ARE AVAILABLE AT SHGS. 1/- EACH.

Notes on the marriage customs of the Kipsigis	(Orchardson)
Pest status of Coffee feeding insects	(le Pelley)
Fluvial Geology, etc	(Reck)
Mimicry, natural selection, etc.	(Carpenter)
Comparative series of skulls, etc.	(Leakey)
Religious beliefs of the Kipsigis	(Orchardson)
Nesting habits of some East Africa Birds	(McInnes)
Notes on Charaxes Pythodorus	(Evans)
Masai social customs	(Whitehouse)
Life histories of some East African Lept.	(Jackson)
The Age of the Rift Valley	(H. L. Sikes)
Marriage customs among the Masai	(Storrs Fox)
Annual Report, 1932	
Luo marriage customs	(Shaw)
Cult of Mumbo	(Nyangweso)
Bride-Price, Nandi	(Huntingford)
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